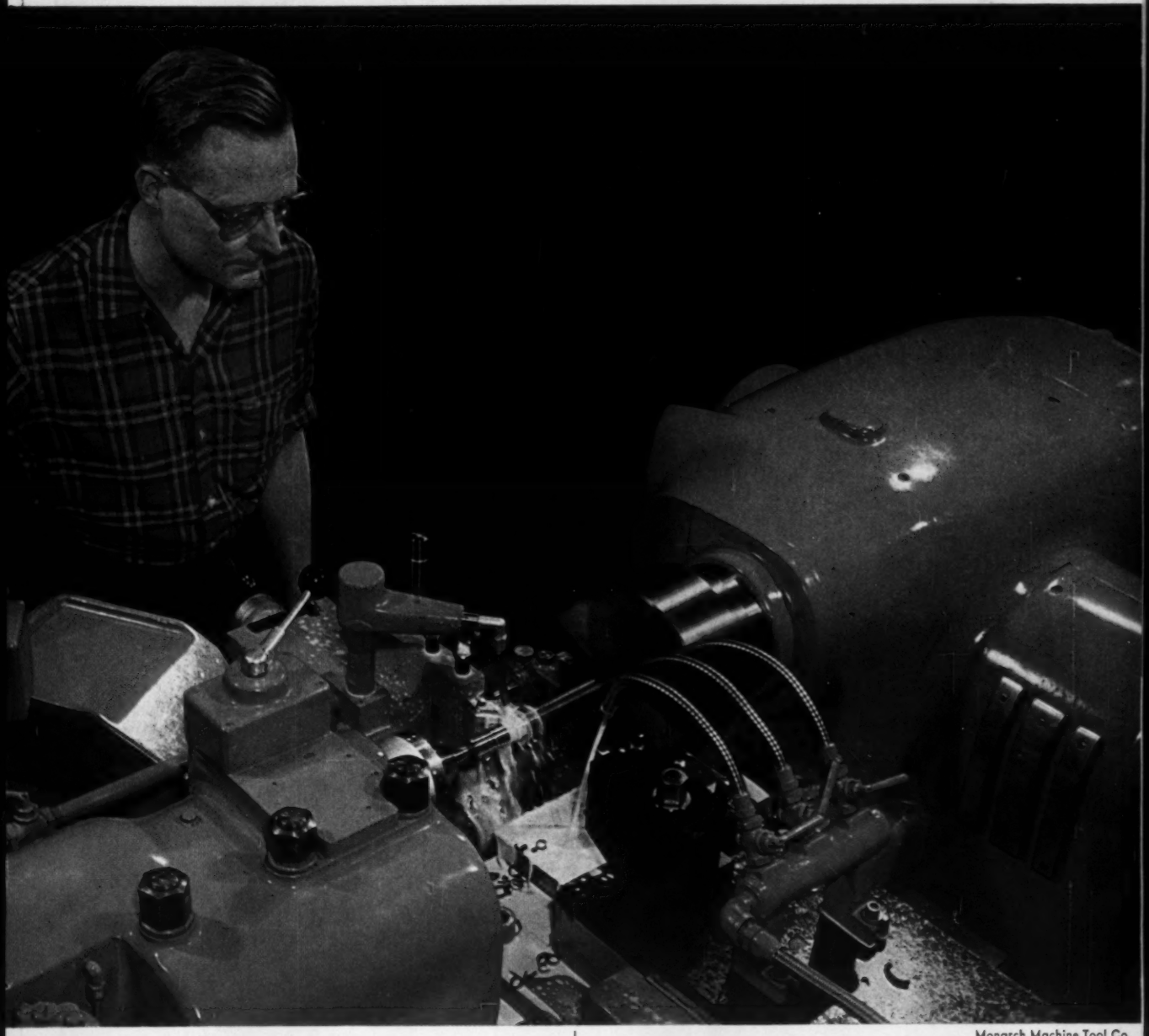
# IRON AGE

THE NATIONAL METALWORKING WEEKLY A Chilton Publication APRIL 27, 1961



Monarch Machine Tool Co.

★ Tool Engineers' Show Feature:

## Research Finds New Ways To Cut Hard Steels p. 101

Where Steel Shipments Really Go p. 67

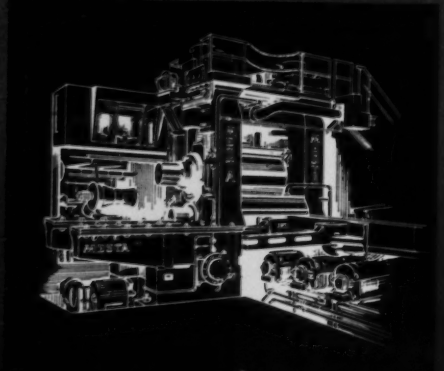
Tool Show Highlights p. 136

Digest of the Week p. 2-3

MESTA 56" Four-High Hot Strip Mill for Rolling Stainless, Silicon, High-Alloy, and Carbon Steels at the Brackenridge Plant of Allegheny Ludlum Steel Corporation

# HOT STRIP MILLS

Designed and Built by MESTA

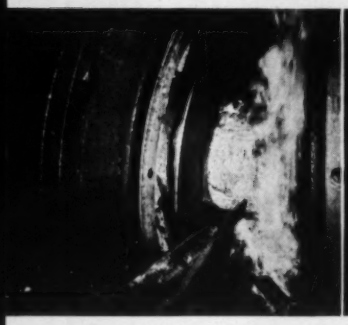


Designers and Builders of Complete Steel Plants

**MESTA MACHINE COMPANY**

PITTSBURGH, PENNSYLVANIA

**START:** Heated billet is centered between dies of the Slick Mill.



**15 SECONDS**
Upset-forging starts.

**30 SECONDS**
Rolling cycle starts.

**40 SECONDS**
Forging is completed.

**55 SECONDS**
Forging is removed from mill.

# One minute... one circular forging

**That's all the time it takes to convert a heated billet (100 to 2,000 lb) into a contoured forging on Bethlehem's unique Slick Mill.**

But fast operation is only one reason why Bethlehem's Slick Mill turns out a top-quality forging at a price that's hard to match.

Ask us, or our nearest sales office, about the quick die changes, which make it possible—and economical—to set up production runs as small as 25 or 50 pieces. Ask about the low die charges which are made possible by the brief contact between die and work. Ask about the light-weight sections this mill can produce, without sacrificing strength.

We'd also like to tell you about the excellent grain flow, machinability, and soundness of every Bethlehem circular forging.

Ask. You'll like the money-saving answers.

Steel *for Strength ... Economy ... Versatility*

BETHLEHEM STEEL COMPANY, Bethlehem, Pa.
*Export Sales:* Bethlehem Steel Export Corporation

**BETHLEHEM STEEL**

BETHLEHEM STEEL

THE IRON AGE, Chestnut & 56th Sts.
Philadelphia 39, Pa., SH 8-2000

# IRON AGE

April 27, 1961—Vol. 187, No. 17

GEORGE T. HOOK, Publisher
TOM C. CAMPBELL, Editor-in-Chief
GEORGE F. SULLIVAN, Editor
E. C. BEAUDET, Managing Editor

News Editor — R. D. Raddant
Technical Editor — J. J. Obrzut
Art Director — T. S. Peaby

**News Staff:** H. R. Neal, Asst. News Editor; P. J. Cathey, J. D. Baxter, B. F. Surer, G. A. Mulligan, Associate Editors.

**Technical Staff:** R. H. Eshelman, Machinery Editor; R. R. Irving, Welding Editor; C. L. Kobrin, Metallurgical Editor; W. N. Redstreake, R. J. Radomski, Associate Editors; C. A. Lewis, Assistant Editor.

**Iron Age Bureaus:** K. W. Bennett, Chicago; T. M. Rohan, Cleveland; G. J. McManus, Pittsburgh; A. E. Fleming, Detroit; F. J. Starin—Nonferrous, New York; R. R. Kay, Los Angeles; G. H. Baker, R. W. Crosby, Washington.

**Correspondents:** F. L. Allen, Birmingham; N. Levenson, Boston; R. E. Koebbe, St. Louis; J. Miller, San Francisco; R. Kazarian, Buffalo; D. R. Coughlin, Seattle; A. T. Collins, Houston; F. Sanderson, Toronto; F. H. Harley, London.

Washington Editorial Office: Nat'l. Press Bldg. Washington 4 ..... EXecutive 3-3474

**Business Staff:**

Marketing Manager — R. H. Groves
Circulation Manager — W. M. Coffey
Production Manager — Warren Owens
Promotion Manager — D. B. Pollock
Market Research Manager — G. V. Shanno
Census Manager — William Laimbeer
Research Consultant — Oliver Johnson

**Regional Business Managers**
*Denotes editorial office also

Atlanta ..... J. W. Sangston
1776 Peachtree St., N. W. — 875-1255
*Chicago 1 ..... T. H. Barry, W. R. Pankow
360 N. Michigan Ave. — RAndolph 6-2166
*Cleveland 15 ..... C. B. Shaw, R. L. White, W. J. Devlin
930 B. F. Keith Bldg. — SUperior 1-2860
Columbus 15, Ohio ..... Harry G. Mumm
LeVeque-Lincoln Tower — CApital 1-3764
Dallas 6 ..... W. J. Smyth
189 Meadows Bldg. — EMerson 8-4751
*Detroit 2 ..... W. J. Mulder
103 Pallister Ave. — TRinity 1-3120
*Los Angeles ..... R. Raymond Kay
3320 Strand, Manhattan Beach — SPring 2-1819
*New York 17 ..... C. T. Post, I. E. Hand
100 E. 42nd St. — OXford 7-3400
*Philadelphia 39 — SHerwood 8-2000
B. L. Herman, J. A. Crites, W. E. Carr
*Pittsburgh 19 ..... T. M. Fallon
1707 Frick Annex Bldg. — ATlantic 1-1830
San Francisco 3 ..... Don May
1355 Market St. — UNderhill 1-1707
W. Hartford 7 ..... Paul Bachman
62 LaSalle Rd. — ADams 6-4237
London, SW 1 ..... A. T. Chapman-Purchas
67/68 Jermyn St. — St. James, TR 6318
Dusseldorf ..... M. F. Holsinger
Huttenstrasse, 17 — Am Ernst-Reuter Pl.
Classified Adv. Sales — H. W. Bozarth
Philadelphia 39 — SHerwood 8-2000

J. H. Kofron — Chilton Research Director
Robert Gunning — Readability Consultant

**Chilton Officers & Directors**
G. C. Buzby, President

Vice-Presidents: P. M. Fahrendorf, L. V. Rowlands, G. T. Hook, R. E. McKenna; Treasurer: W. H. Vallar; Secretary: J. A. Montgomery; Directors: M. E. Cox, F. P. Tighe, E. B. Terhune, Jr., R. W. Case, Jr., C. A. S. Heinle, J. H. Kofron, G. E. Cameron. Comptroller, Stanley Appleby

Indexed in Applied Science & Technology Index and Engineering Index

Copyright 1961 by Chilton Company

The IRON AGE, published every Thursday by CHILTON COMPANY, Chestnut & 56th Sts., Philadelphia 39, Pa. Second class postage paid at Philadelphia, Pa. Price to the metalworking industries only, $2 for 1 year, $3 for 2 years in U.S., Canada $10, all others $15 for one year. Latin America $25. Other Foreign $35. Single copies 50¢. Annual Issue $2. Cable: Chilton Philadelphia.

## Digest of the Week in Metalworking

### News of the Industry

**Construction Paced Steel Users in '60:** Automakers second in use. 67
**Tax Reform Faces Rough Road:** President's plan goes to Congress. 69
**Alcoa Raps Some Aluminum Pricing:** Dislikes promotional pricing. 70
**How Welding Equipment Makers Win Sales:** Price edge aids exports. 71
**Why Business Embezzlements Soar:** Companies aren't cautious enough. 72
**Red China's Industrial Progress:** Editor Tom Campbell reports. 74

### Engineering-Production Developments

***ASTME TOOL SHOW FEATURES:**

***Machining Hard Steels?:** Focus more attention on minute details. 101
***Show Previews: 136 *Show Program: 150 *Exhibitors List: 155**
**Manganese Alloy Gets New Use:** Reduces weight of structural rails. 109
**Steel Plate Is Clad With Titanium:** Argon flush eliminates oxidation. 110
**Recorder Checks Tape-Controlled Mill:** Costly downtime tumbles. 112
**Roll-Weld Method Bonds Panels:** Simple tooling turns out honeycomb. 114

### Markets and Price Trends

**Steel Summary:** Another 10 pct gain in sales forecast for May. 159
**Nonferrous:** Big Three aluminum producers predict better business. 168
**Compare Foreign Prices:** Check with U.S. prices may be worthwhile. 160
**Aerospace Industry Hunts New Metals:** More development work needed. 91
**Does Hand Assembly Pay?:** Old idea in new form helps smaller plants. 93

### Editorial

Soviet Strategy:
It's a Long-Term Headache 5

### Metalworking Newsfront

Business Forecast 7
Metalworking Labor 9
Washington 11
International 13
Techfront 15
Market-Planning Digest 65
Report to Management 87
Spacefront 99
Steel Summary 159

### Industry Trends

Automotive 89
West Coast 91
Machine Tools 93
Purchasing 160

### Markets and Prices

Price Section 159
Steel Products 162
Ferrous Scrap 164
Nonferrous 168

### Departments

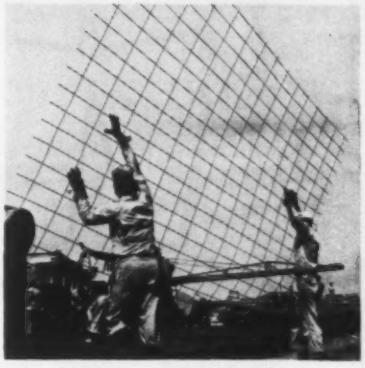
Letters 25
Fatigue Cracks 27
Meetings and Exhibits 29
Industrial Briefs 78
Men in Metalworking 95
New Patents 118
Technical Literature 121
Design Digest 125
Clearing House 178

ADVERTISING INDEX ... 184

# Special This Week

## How to Machine Hard Steels

Most steels are machinable. But cutting requirements get more stringent as you move up the hardness scale. To machine steels that are harder than 300 Bhn, the Monarch Machine Tool Co. maintains control of all vital factors. If you overlook these areas, tool life is likely to be very close to zero. p. 101



## Builders Topped Steel Users in '60

Leading steel consumer last year was the construction industry, according to IRON AGE analysis of finished steel shipments. Study, which divides warehouse tonnage among actual users, shows builders took 26 pct of all shipments. p. 67

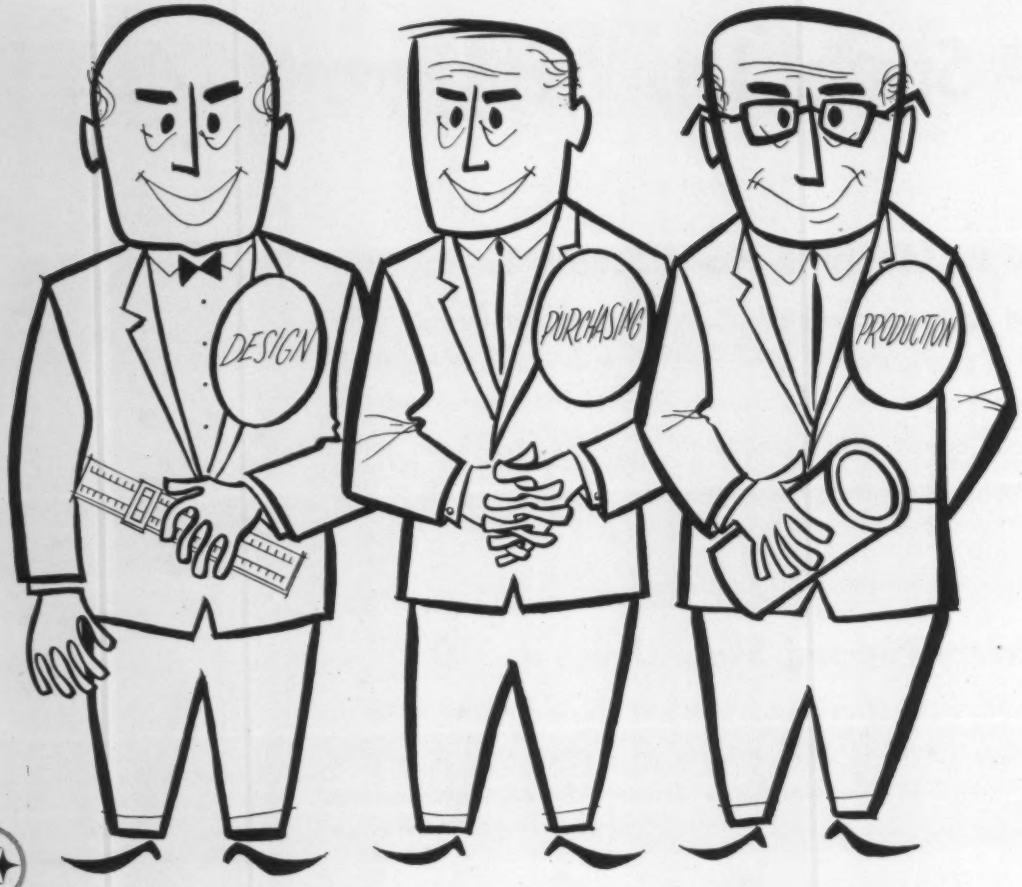
## How Fast Is Red China Moving?

Analyzing the rate of Red China's industrial growth is difficult. But in this final article on the Far East, Editor-in-Chief Tom Campbell carefully assesses the country's progress, economically and industrially, emphasizing the metals outlook. p. 74

## Next Week

## FTC Chairman Dixon Speaks Out

The IRON AGE interviews FTC Chairman Paul Rank Dixon on questions before the FTC that have an effect on business. Examples: What can be expected of the FTC under the new Administration? What about "administered" prices?




# ALL THREE CAN CONTRIBUTE MORE TO LOWER UNIT COST

## because of B&W Job-Matched Tubing

How so? B&W makes sure the purchasing agent gets the proper steel tube for the job—when he wants it, at a competitive price. The design engineer can choose from B&W's complete selection of types, grades and sizes to put flexibility into his design—economy and efficiency into the finished product. The production manager can count on B&W's uniform properties and dimensions for fast, easy fabrication —high-speed, low-cost production. In being able to satisfy the specific requirements of all three, B&W Job-Matched Tubing assures a high quality finished product at the lowest possible unit cost.

May we tell you more? Just call your local B&W District Sales Office or write for Bulletin T-469. The Babcock & Wilcox Company, Tubular Products Division, Beaver Falls, Pennsylvania.

B&W

THE BABCOCK & WILCOX COMPANY

***TUBULAR PRODUCTS DIVISION***

TA-1001-G

Seamless and welded tubular products, solid extrusions, rolled rings, seamless welding fittings and forged steel flanges—in carbon, alloy and stainless steels and special metals

# Soviet Strategy: It's a Long-Term Headache

The Russians don't want a world war—yet. Maybe they don't want one later. They hope they can avoid it for the time being while they attempt to hamstring us throughout the world.

Mr. Khrushchev (and others like him to follow when he goes) feels that, given time, Soviet international machinations will win the cold war—without firing a missile.

Mr. Kennedy's strong statement on Cuba may give pause to Mr. K's bomb-rattling jingo statements. But we doubt it. Perhaps Mr. K will be able to escape a showdown in this hemisphere. But sooner or later, he may make a fatal miscalculation.

The Reds' strategy ought to be clear to most of us. But apparently it isn't—judging from the interest most of us take in our responsibilities. The Reds are attempting—with some success—to mire us in the quicksands of frustration around the world.

No sooner are we faced with trouble in the Congo than a new area shows up. If it isn't Laos, it is South Vietnam. And when those fires are burning brightly a new one shows up—this time on our own door step.

If the Cuban rebels eventually fail to dislodge Castro, it means even more trouble for us. There is no assurance that our disciplined behavior is appreciated by many South American nations. Mr. K knows this.

Russia's long-term strategy is to demean completely the United States in the eyes of our friends, of the envious, of the downtrodden, of the underdeveloped, and in the eyes of those who can't tell truth from lies. Russia may have more success than we dare allow ourselves to think.

The Reds' success comes because we can't lie and scheme as they have done and are doing. Each crisis is being faced as it comes up. But for the years ahead, we must plan a little better.

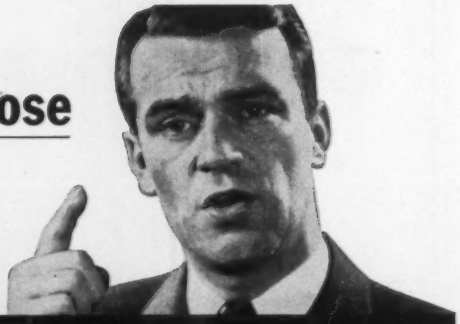
The Reds have their plans well in mind. They hope that, in the long run, they can so completely discredit us in the world that a takeover without war will be easy. That is what they think, no matter how stupid it may seem to us. All their planning is towards that goal.

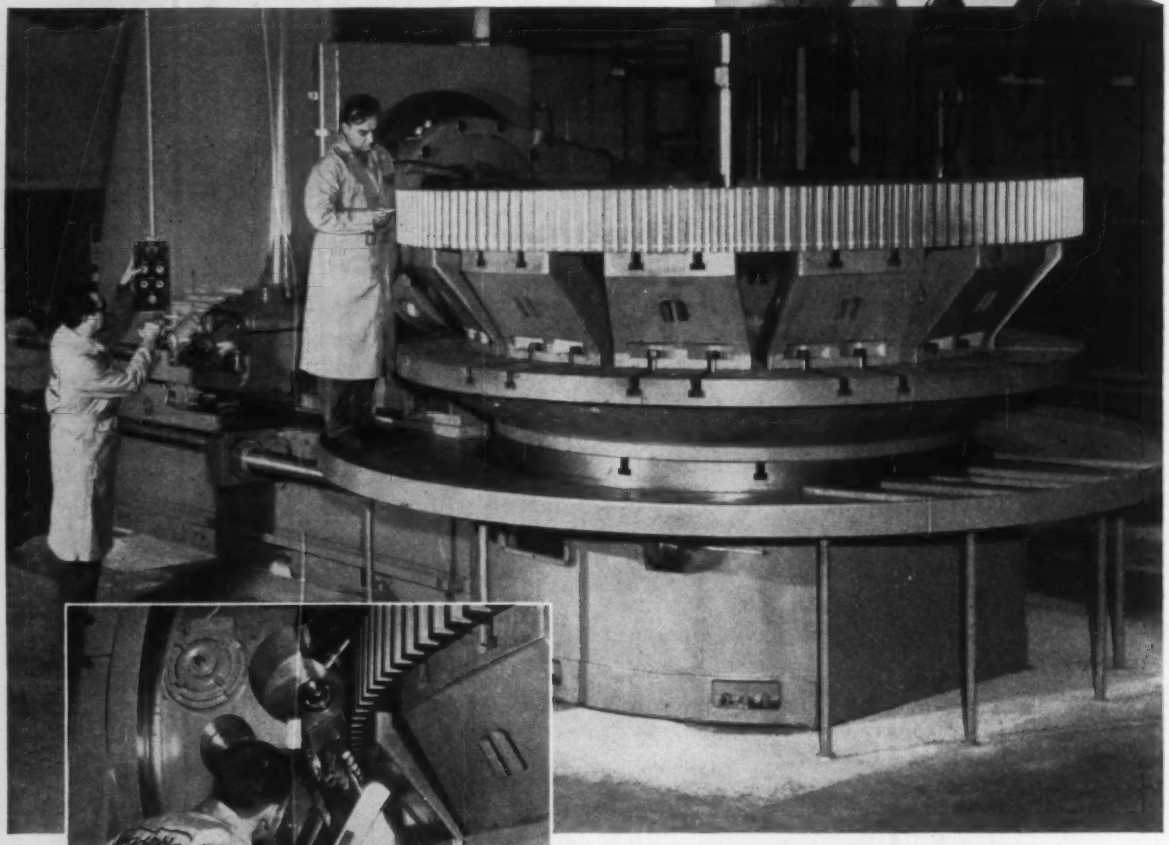
The horrible thing is that they and their leaders may take the fatal step because they don't know that we will never be a pushover no matter what the cost.

Tom Campbell

Editor-in-Chief

# "Had to have extremely close tolerances...so I called Phillie Gear"





Phillie Gear's new hobber at work . . . will handle gears up to 165" dia., 64" face width.

Looking for commercial gearing, cut to exceptionally close tolerances . . . at no increase in cost? Then give us a call. We are equipped better than ever before to meet your needs with the highest quality commercial gearing available today.

This new hobber, the latest addition to our new and expanded facilities, is the machine that can turn out the big ones. It is the most rugged, precise gear hobber we've ever seen. It was custom built to our rigid specifications. Accuracy is certified to ten arc seconds.

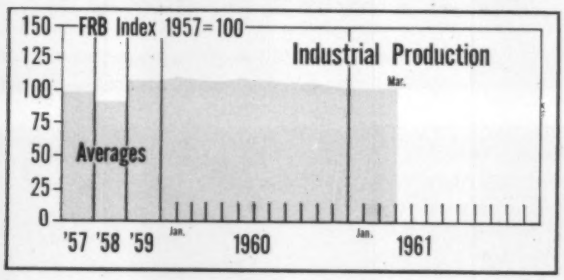
Whatever your gearing requirement, our engineering staff is ready to work with you in finding a better solution to your gearing problems. And engineering is backed by the newest, most comprehensive production facilities in the industry.

For complete data, write on your company letterhead for our gearing catalog G-127.

**phillie gear®** / **PHILADELPHIA GEAR CORPORATION**
King of Prussia (Suburban Philadelphia), Pennsylvania

## After Leveling, How Fast a Climb?

The March rate of industrial production (102 on the Federal Reserve Board's Index) doesn't tell half of




the story. For one thing, you can bet the April rate, which represents the current rate of business, will be up at least a full point and possibly more when you see it a month from now.

But the aid and comfort to be drawn from the March rate is that it did show a leveling off—after six months of steady, persistent decline. March had a lot of things working against it. Auto production was way down, although now showing a pickup. During the month, manufacture of materials gained, while manufacture of industrial products declined while industry watched sales rates and inventories.

## Durable Goods Orders Up

Probably the most encouraging in the March indicators: Sales and orders of durable goods manufacturers are up. The increase is modest, about 1 pct over February. This puts orders at $13.5 billion, seasonally adjusted, and sales at $13.4 billion.

What to watch now is whether these indicators will continue to climb; of next importance, whether new orders climb ahead of sales (shipments.) In any sustained upturn, both sales and shipments climb, but orders must exceed the rate of shipments to maintain a steady uptrend.

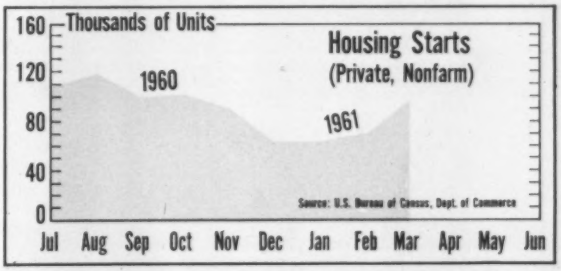
## Are Railroads Checking Budgets?

It doesn't show up in the figures yet, but the railroads may be picking up their spending rate. March orders are for only 1796 cars. This is an improvement over February's orders of 1536, but nothing to brag about.

On the other hand, increased sales of specialized railway equipment during the past 30 days may indicate a pickup in railroad purchasing. This is the opinion of W. E. McKittrick, vice president of Sparton Railway Equipment Div. of Sparton Corp. His company has received significant new orders for specialized load protection systems from five major railroads since March 15. This, of course, has no specific effect on carbuilding, but could point to an easing of railroad equipment money.

## Home Building Shows New Life

Back in February, when housing starts were limping along at a seasonally adjusted annual rate of only a little over 1.1 million, everybody knew things had to get better. And a 38 pct increase in March confirmed the hopeful attitude. Private nonfarm starts in March, 99,800, brought the annual rate up to 1.25 million, not too bad a rate for a recession period. With easier credit here or on the way, the outlook for home building

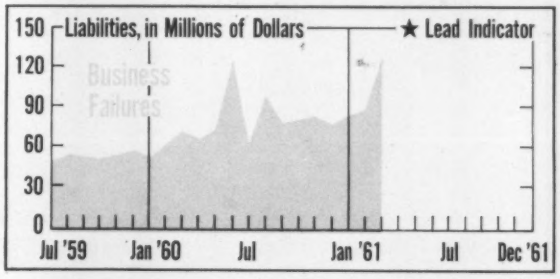



this year is more encouraging. In addition, the rate of building permits tends to confirm the hopeful outlook.

## Business Failures Defy the Trend

Business failures, at new monthly highs for both total number and liabilities, defy the general feeling of better business conditions. The March toll, according to Dun & Bradstreet:

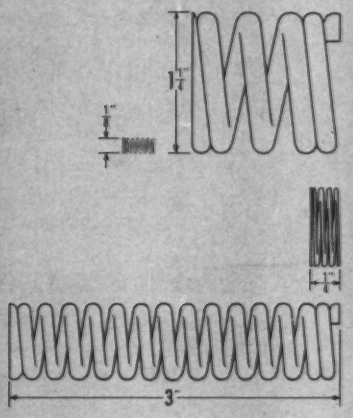
A total of 1610 businesses went under during the




month. Involved were liabilities of $126.6 million. Although manufacturing companies were among the categories showing increases in rate of failure, machinery and transportation equipment were exceptions.

# DISC GRINDS WIDE RANGE OF SPRINGS

Gardner 2V18-24" vertical double spindle grinder. Capacity: spring diameter ⅛" to 1¼"
spring length ¼" to 3"
wire diameter 0.030" to 0.140"




grinds **two** surfaces parallel in **one** operation

# GARDNER

precision disc grinders

GARDNER MACHINE COMPANY, BELOIT, WISCONSIN
a subsidiary of Landis Tool Company

## IAM: Starts Drive Against Moonlighting

Union leaders may be trying to put their house in order before building up the drive for a shorter workweek in major metalworking contract negotiations this summer.

HAYES: Moonlight worries.

"Moonlighting" is the target of a circular from the International Association of Machinists to all of its 2163 Local and District Lodges. The circular is signed by IAM president A. J. Hayes and general secretary-treasurer E. E. Walker.

"The problem of moonlighting is serious enough now," it says. "When we reach our goal of a 35-hour week, there is danger that it may become even more serious."

It urges members to discourage other members from "using union-won leisure to undercut the job conditions—and lessen the job opportunities—of other workers."

## Automation Hearings: Are They One-Sided?

Are the House hearings being conducted by the Holland Subcommittee on Unemployment and the Impact of Automation "fixed" to favor unions?

Not true, says chairman Elmer J. Holland (D., Pa.). In the first of a series of reports on progress of the hearings, he points out that any lopsidedness in testimony will be the fault of management.

**"Although invitations to appear were issued to all, it was not until nationwide publicity was given to various statements made by union representatives that we heard from management," he charges.**

**Further, he says, top executives from leading companies have scheduled appearances or said they would appear, then have either cancelled-out or are stalling.**

## Labor Dept. Sets Up Automation Office

Office of Automation and Manpower has been set up in the Dept. of Labor. Deputy Assistant Secretary Seymour Wolfbein, a manpower analyst, has been named director by Secretary of Labor Arthur J. Goldberg.

## AIWU: Eaton Workers Have Third Thoughts

Two local unions at Eaton Manufacturing Co.'s Reliance Div., Massilon, O., had third thoughts on taking a 16¢-an-hour cut in wage costs to save their jobs.

Eaton says it has signed one-year contracts with Locals 28 and 306 of the Allied Industrial Workers Union of America. Changes in fringe benefits costs and some productivity standards are designed to trim wage costs and enable the plants to operate competitively.

## URW: Settle Short of Goal

United Rubber Workers Union has settled with industry giants for less than it was bargaining for. It apparently abandoned its big push for "a broad program to provide economic security in an age of automation." (IA—Mar. 23, '61, p. 9).

**The URW had hoped to get an "automation fund" to cover retraining and moving of workers displaced by automation or technological changes.**

Only minor job security was worked out for workers at Goodyear Tire & Rubber Co. and Firestone Tire & Rubber Co., union representatives told The IRON AGE. This principally provides retention of displaced workers in bargaining units.

**Outstanding development for the rubber industry was the distinction made between tire and non-tire workers. Since World War II wage hikes have been across the board.**

Another departure from the past involves the fact that Firestone's settlement provides wage boosts as well as general contract provisions. Generally, wages are covered in separate negotiations held later. Wages weren't covered in Goodyear's settlement.

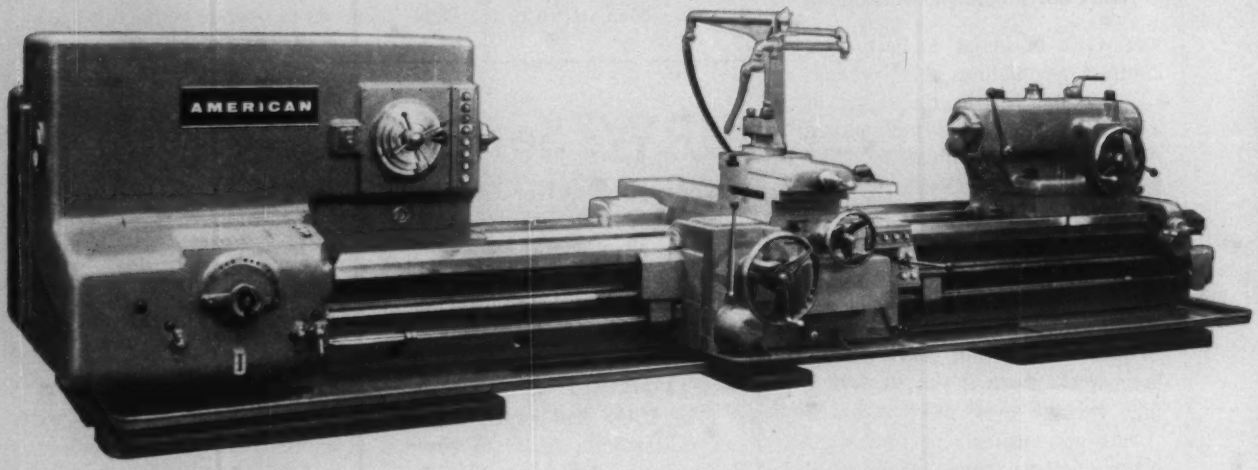
Firestone's tire workers get 7.5¢ on June 5, another 7¢ in June, 1962. Industrial product workers get 3.5¢ this year, 4¢ next year.

Workers with five-years seniority, laid-off for two or more years, will be able to take a lump-sum separation payment rather than continuing on laid-off status with seniority rights.

# TALK ABOUT ABILITY!

This husky boasts a 100 hp main drive motor and spindle speed range of 6 to 750 rpm. Its massive 7½" tailstock spindle offers big load capacity. Pre-selective hydraulic powershift and push button control of cross and longitudinal feeds keep this giant under fingertip control. 48 spindle speeds provide any surface speed with a deviation of less than 6% from that actually required for the chosen diameter. The operator, after setting the correct surface speed, merely dials the work diameter. The computing dials then automatically produce the correct rpm for each diameter. Or . . . the operator may choose rpm directly if he wishes. Write for Bulletin 913-A.

## 100 HORSEPOWER AMERICAN 40" STYLE J-100 PRE-SELECT ENGINE LATHE




This and all other AMERICAN machine tools are available on "Toolease", our own equipment leasing plan.

COMPETE COMPETENTLY WITH

**AMERICAN**

LATHES • RADIAL DRILLS
SPECIAL MACHINES

## The American Tool Works Company

Pearl Street at Eggleston Avenue • Cincinnati 2, Ohio

# ★ Another Price Probe Coming

A new "administered prices" investigation—taking in the steel, auto, and machinery industries—is underway in Washington. The new probe seeks to answer the question:

**"Are administered prices related to the deterioration of the export position of the United States?"**

Looking for the answers is Dr. Walter Adams, a Michigan State Univ. economist. He is working under the auspices of the Senate Antitrust and Monopoly Subcommittee. Again, this is Sen. Estes Kefauver's pet project.

Dr. Adams tells The IRON AGE he is now collecting background statistics in an effort to find out if the problem exists. If it does, he comments, new administered price hearings would undoubtedly emerge.

"All administered price industries are under study, including steel, autos, electrical machinery, and other machinery," Dr. Adams notes. He says the first step in the probe is a study of U. S. census data by commodity and industrial groups. The investigation will go into industries in depth later.

Dr. Adams says the new pricing probe stems from the question being raised in industry and government—are we pricing ourselves out of the world market?

The investigation appears to be part of Sen. Kefauver's plan to keep the pricing policies of industry before the public. The Senator's subcommittee is now in the midst of public hearings on price-fixing and bid-rigging in the electrical manufacturing industry.

Sen. Kefauver seems to have the backing of the Administration, particularly the Justice Dept. and the Federal Trade Commission.

## ■ Full Support For Latin American Aid?

American businessmen working with Latin American nations through U. S. foreign aid programs may benefit from the windfall of foreign aid which appears headed south.

**In an almost unprecedented action, a House appropriations subcommittee has approved the entire $600 million in special foreign aid for Latin America requested by President Kennedy.**

The appropriation, which has a good chance of being backed up by Congress, was made because of the Cuban situation. Committee leaders say they shelved their economy ax for fear that some Latin American countries would misunderstand a reduction in the funds.

The committee admits it had appropriated the $600 million without any justification except that the Administration promised the money.

## ■ Senate May Push Ore Development

The Senate may probe the possibility of developing uses for low grade iron ore produced in the upper Great Lakes basin.

Sen. Philip A. Hart, (D., Mich.), has proposed the investigation to Sen. John A. Carroll, (D., Colo.), chairman of the Senate Minerals Subcommittee.

Sen. Hart says: "There is evidence that additional efforts should be made to encourage basic and applied research in beneficiation of presently non-economic ores."

He hopes an investigation would result in documentation of the best ideas of experts from the government, mining schools, and private industry interested in developing uses for low grade iron ore.

## ■ Right to Buy

Congress is taking a new look at an old problem—the right to buy and the refusal to sell. Complaints to Congressmen from businessmen that they can't buy goods they want have spurred calls for a "must sell" law.

Under such a law, manufacturers would be denied the right to choose their customers in some cases.

Sen. Russell B. Long, (D., La.), is writing a bill to spell out the circumstances under which sellers must sell to buyers.

## ■ New Branch Would Influence Construction

The Dept. of Urban Affairs and Housing sought by President Kennedy would have a tremendous influence on the nation's construction industry.

The Cabinet-level department, now being considered by Congress, would coordinate all government housing programs, including Federal financing programs. It also would take over Federal programs for urban and metropolitan affairs.

Besides planning housing moves to eliminate slums and provide adequate housing for Americans, the department would consider industrial questions. President Kennedy says its policy would include:

"The provision of adequate locations for industrial and commercial facilities to create new employment opportunities and to assist in the establishment of increased and a more stable tax base."

FOR NEW IDEAS IN

HEATING AND MELTING BY INDUCTION...

The complete line of furnaces for die casting includes: Single Hearth Holders; Single or Double Hearth Ajaxomatics for automatic pouring; Double Hearth Melters and Holders for hand ladling.

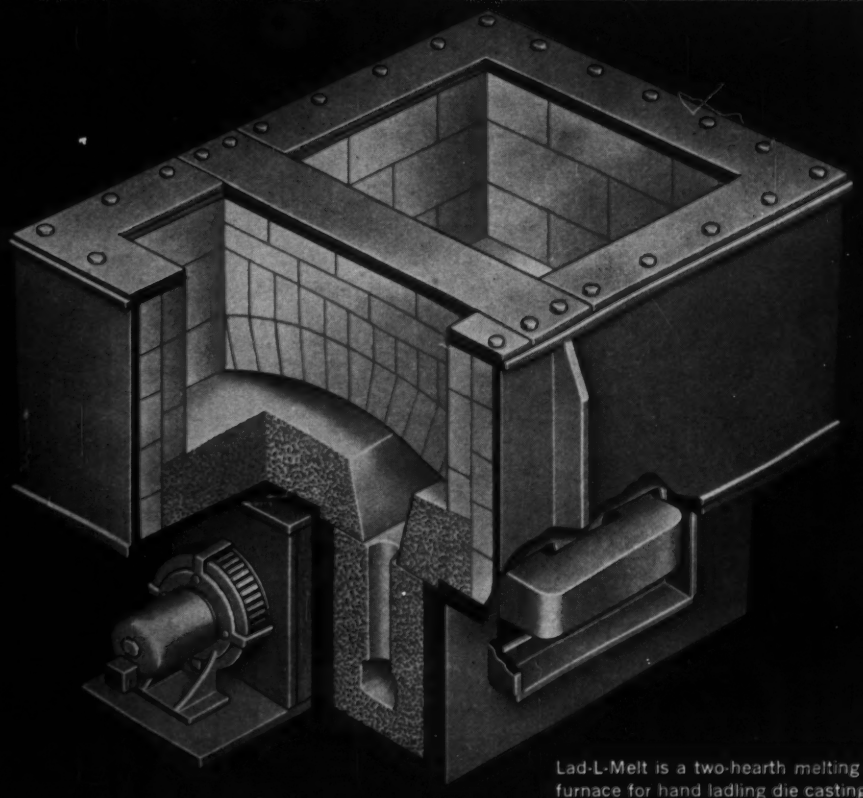
WATCH

AMX

*Induction Heating is our ONLY Business*

Ajax Magnethermic CORPORATION

**GENERAL OFFICES** P.O. Box 839 • Youngstown 1, Ohio
**TRENTON DIVISION** 930 Lower Ferry Road • Trenton 5, New Jersey
**YOUNGSTOWN DIVISION** 3990 Simon Road • Youngstown 12, Ohio
**AJAX MAGNETHERMIC, CANADA, LTD.** Box 779 • Ajax, Ontario



Lad-L-Melt is a two-hearth melting and holding furnace for hand ladling die casting operations.

## No More Secrecy Over Red Exports

The cloak of secrecy covering the names of companies exporting to Communist nations is being lifted. Commerce Secretary Luther Hodges is ordering that the names of export license receivers be made public.

Under the new ruling, the name of the company, goods to be shipped and destination of shipments will be published by the Dept. of Commerce.

Commerce issues about 12,000 licenses each month. Most are for exports to the Soviet Bloc.

## Steel Exports, Imports Show Slight Gain

Both exports and imports of steel mill products rose slightly in February.

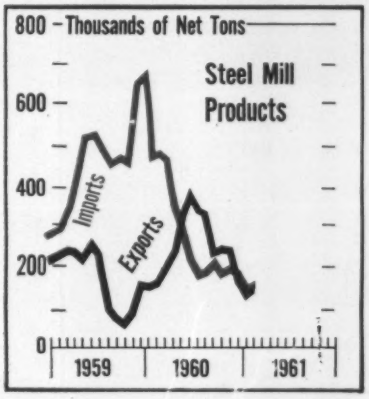
According to Dept of Commerce statistics, February's exports rose to 147,000 tons. Imports went up to 152,000 tons.

January's exports of steel mill products were set at 132,000 tons; imports at 145,000 tons. Even with the moderate gain for exports, the tonnage figure was still 20,000 tons below that of February, 1960. The import figure dropped to less than one-third of strike-influenced February, 1960.

During the first two months of this year, exports were 3.1 pct of the total tonnage shipped by American mills. That's a drop from the 4.2 pct last year.

Tinplate and sheet were responsible for the biggest export gains in February. Steel pipe shipments accounted for the bulk of the imports gain. The pattern for the first quarter shows a sharp drop in both imports and exports as compared to the last quarter of 1960.

While import tonnage exceeds exports again in February, the value




of exports is considerably higher. Dept. of Commerce reports place the export value at $31.6 million; import value at $20.9 million.

## Japanese Bypass Red China Market

A top Japanese businessman says Red China offers only a "very limited" market for Japanese exports. And, he says, recognition of the Communist nation by the United Nations wouldn't drastically change this situation.

Kiichiro Satoh, chairman, Japanese Trade Mission to the United States, told The IRON AGE: "The people of Japan and the people of Red China cannot freely cross each others borders. As long as this is the case, I don't think trade will increase."

**SATOH:** A Red Market?

Mr. Satoh says only 1.4 pct of Japan's exports now go to Red China. If Communist China were to be admitted to the UN, "it would make very little difference in our trade policies and our trade needs," he says. (See "Closeup of Industrial Red China," p. 74.)

## International Postage Will Climb Soon

The cost of business mailing continues to rise. New rate schedules for international mail go into effect July 1. And the White House is also seeking higher domestic postal rates.

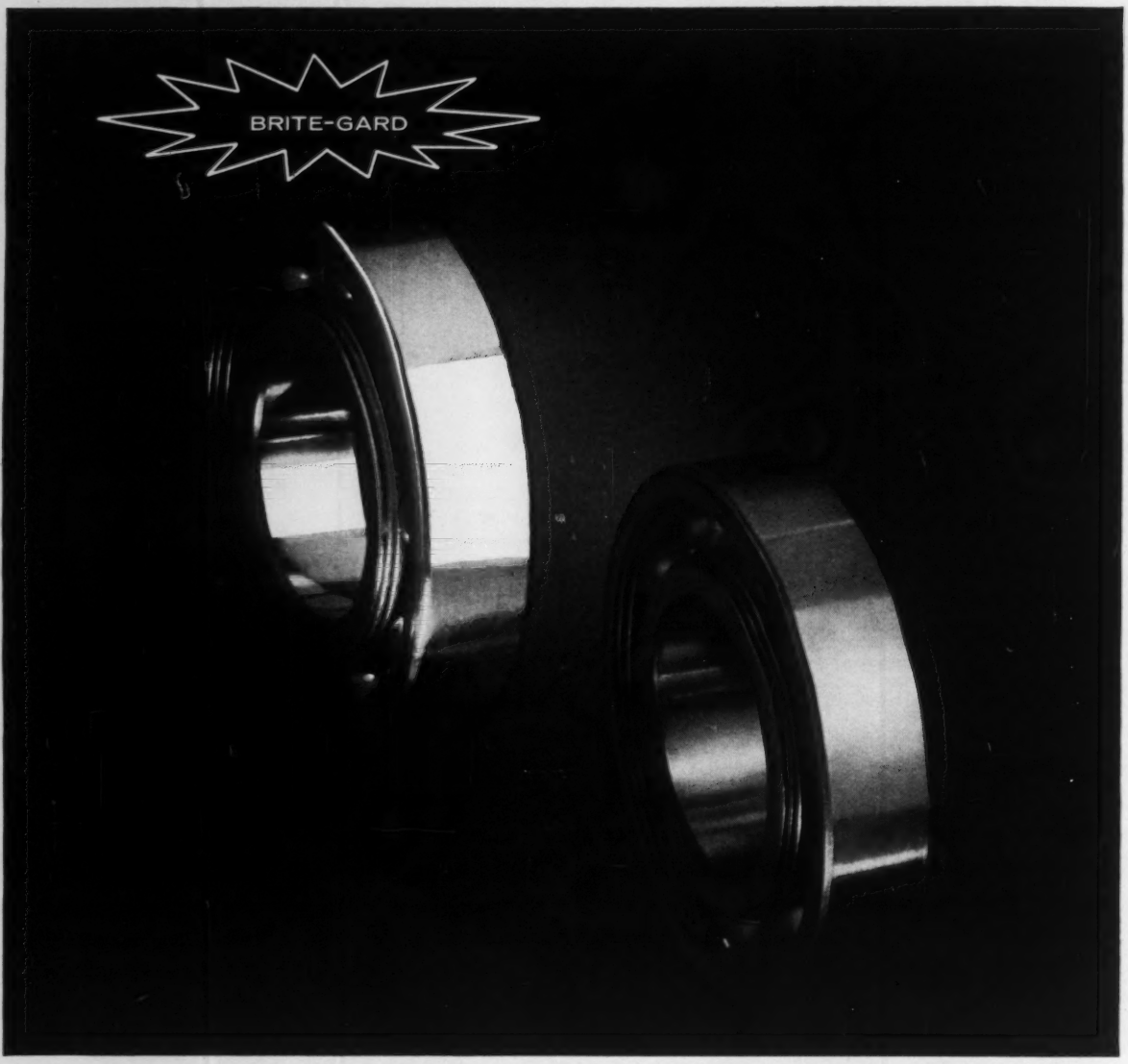
Businesses with foreign subsidiaries will feel the bite of the higher international rates. Postage to countries other than Canada and Mexico will rise from 8 to 11 cents per ounce. Rates to Canada and Mexico will remain at four cents an ounce.

Post Office officials say the new rates will help erase the $18 million annual deficit in international mail.

## New Steel Mill Planned at Ghent

A new steel mill will be constructed in Ghent, according to Belgian sources. The mill is being backed by a combination of Belgian, Luxembourg, and French companies. Estimates call for an annual capacity of between 1.4 and 2.2 million tons.

The Ghent location will put the mill in a seaport area. The Terneuzen Canal, connecting Ghent with the North Sea, is already deepened and equipped with locks. This will permit the waterway to handle seagoing cargo vessels up to 50,000 tons.




# A BRITE NEW IDEA BY NEW DEPARTURE

## BRITE-GARD SUPER FINISHING FOR SUPER PRECISION BALL BEARINGS

There's a big difference in New Departure Ball Bearings . . . a difference you can see at a glance. It's new super-polished Brite-Gard finish . . . available only from New Departure!

Brite-Gard is another shining example of New Departure's policy of passing on to its customers significant bearing developments. Brite-Gard treated bearings . . . with smoother surfaces and corners . . . are less susceptible to the adherence of dirt. They are more resistant to corrosion from handling, too. Furthermore, Brite-Gard gives you bearings of optimum appearance.

Brite-Gard is now available on all N/D super precision grade ball bearings—at no extra cost.

Moreover, New Departure offers other customer services. Why not invite the local New Departure Sales Engineer to participate in your next early design discussion? He is a fully qualified graduate engineer, backed by more than 50 years of ball bearing engineering and manufacturing experience. His design recommendations may save you time and money. Or write New Departure, Div. of General Motors Corporation, Bristol, Connecticut.

**NEW DEPARTURE**

**BALL BEARINGS · PROVED RELIABILITY YOU CAN BUILD AROUND**

## New Rust Preventives?

Recent tests reveal that calcium and zinc molybdates equal or exceed the rust-preventive characteristics of red lead and other commonly-used rust inhibitors. This is the word from scientists at the Battelle Memorial Institute. They also note that the molybdates have two advantages not shared by red lead, zinc chromate and iron oxide: They're nontoxic and white in color.

## Steps Up Shaft Strength

**Shot peening hollow shafts increases their torsional strength. Peening with blunt-nosed blows work hardens the shafts' outer surfaces in a manner similar to forging. What improvement does this bring? In one case, shot-peened axles withstood 8,000,000 torsion-stress reversals before failing. Identical axles, left unpeened, failed after 6,000,000 torsion-stress reversals.**

## Improves Power Stations

Programs planned and underway for expansion of electric-generating plants will employ increased amounts of stainless steel. Experience in steam-power stations with stainless condenser tubes proves that these tubes will last up to 30 years. In many locations, river water flowing through such tubes has a highly-corrosive acid content.

## Strong, Ductile Steel

**A new tool steel boasts a tensile strength in excess of 350,000 psi. Even at this high-strength level, the newcomer has good ductility and impact strength. It's slated for use in tools and dies that require plenty of shock resistance. As an ultra-high-strength steel, it can also serve in critically-stressed components where maximum strength is a must with no sacrifice in toughness.**

## Protective Coatings

The benefits of vacuum-deposited multifilms may someday be applied to a variety of products. As the name implies, multifilms consist of metallic or non-metallic layers coated on a base material. The base can be metal, glass, Pyrex or quartz. Multifilms have almost no thickness: Thus they absorb little energy. This means that they can dissipate unwanted heat while withstanding extremely high temperatures.

## Deflash Rubber Products

Mechanical-impact machines offer a new way to remove flash from molded-rubber parts. First, carbon-dioxide gas freezes the flash. Then an eight-bladed wheel hurls tiny steel pellets, in a controlled pattern, across the deflashing chamber. Operating at 3000 rpm, the wheel sprays 20-million pellets a second or 350 lb of impact media per minute. This process can be used to deflash rubber parts with thin-wall sections.

## Pumps Liquid Metal

**At Moscow's Imeni Likhachev automobile plant, tests are now being conducted on a magnetic pump for transporting liquid cast iron. This pump "uses a traveling magnetic field to transfer the molten metal directly from the melting furnace into molds." If successful, the liquid-metal pump will replace both ladles and cranes.**

## Finishes Complex Shapes

Rotating metal parts beneath an oscillating microstone yields surface finishes of 1 microinch or better. With abrasive action, the microstone shapes itself to the parts' circumference. Then it levels all hills and valleys left from prior machining. Under a constant flow of fluid, microstoning polishes large work runs. It has been used to correct the roundness of thousands of double-diameter spools to within 0.00002 in., at a speed of 15 finished parts per minute.

## Resists Corrosion

Dow Chemical Co. reports an "improved process" for hot-dip galvanizing of steel. Adding a pinch of magnesium to the bath improves corrosion protection from 20-90 pct. Studies show major improvements in resisting corrosive industrial atmospheres when magnesium is added to the bath in amounts of 0.04-0.05 pct by weight.

# *Fast Cool*....2100° to 500° in 14 minutes!

**with a 300 lb. load,**

Ipsen VFC-300
Automatic Vacuum
Heat-Treating Unit.

— and at

½ THE OPERATING COST OF A HYDROGEN FURNACE!

For complete data and specifications,
Write Ipsen — or contact your nearest Ipsen representative.

AUTOMATIC Ipsen HEAT TREATING UNITS

IPSEN INDUSTRIES, INC. • DEPT. 723 • P.O. BOX 500 • ROCKFORD, ILLINOIS

# BEVEL GEARS FORGED A NEW WAY!

**Now . . . by our unique combination of specialized Rolling and Drop Forging, Milwaukee Forge offers quality Bevel Gears as you want them . . . when you want them!**

Our method will be of interest to you if your requirements fit the following ranges:

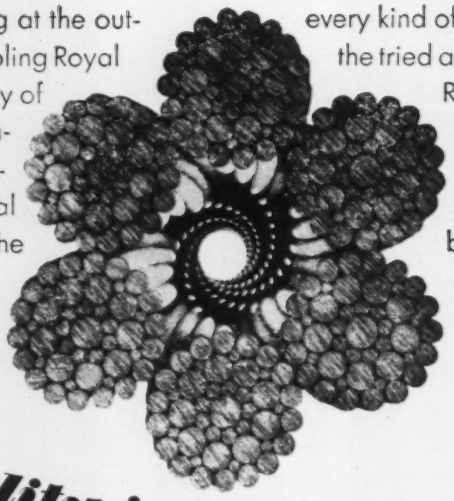
Forged Weight . . . . 30 lbs. to 100 lbs.
Inside Diameter . . . . . 6″ to 13″
Outside Diameter . . . . . 11″ to 18″
Quantity Runs . . . . . 50 to 5000

MF

## MILWAUKEE FORGE & MACHINE COMPANY

1532 E. Oklahoma Avenue, Milwaukee 7, Wisconsin

Here are two ways of looking at the outside and *inside* quality of Roebling Royal Blue Wire Rope—the uniformity of wires and strands. Their symmetry would be relatively insignificant, however, without Royal Blue's *extra* high strength. It's the combination that is the source of real wire rope savings. For long, economical service on every kind of job, there is no substitute for the tried and proven quality of Roebling Royal Blue. It pays off for *you*. Learn more about Royal Blue from your wire rope distributor, or write now for free booklet to Roebling's Wire Rope Division, Trenton 2, N.J.

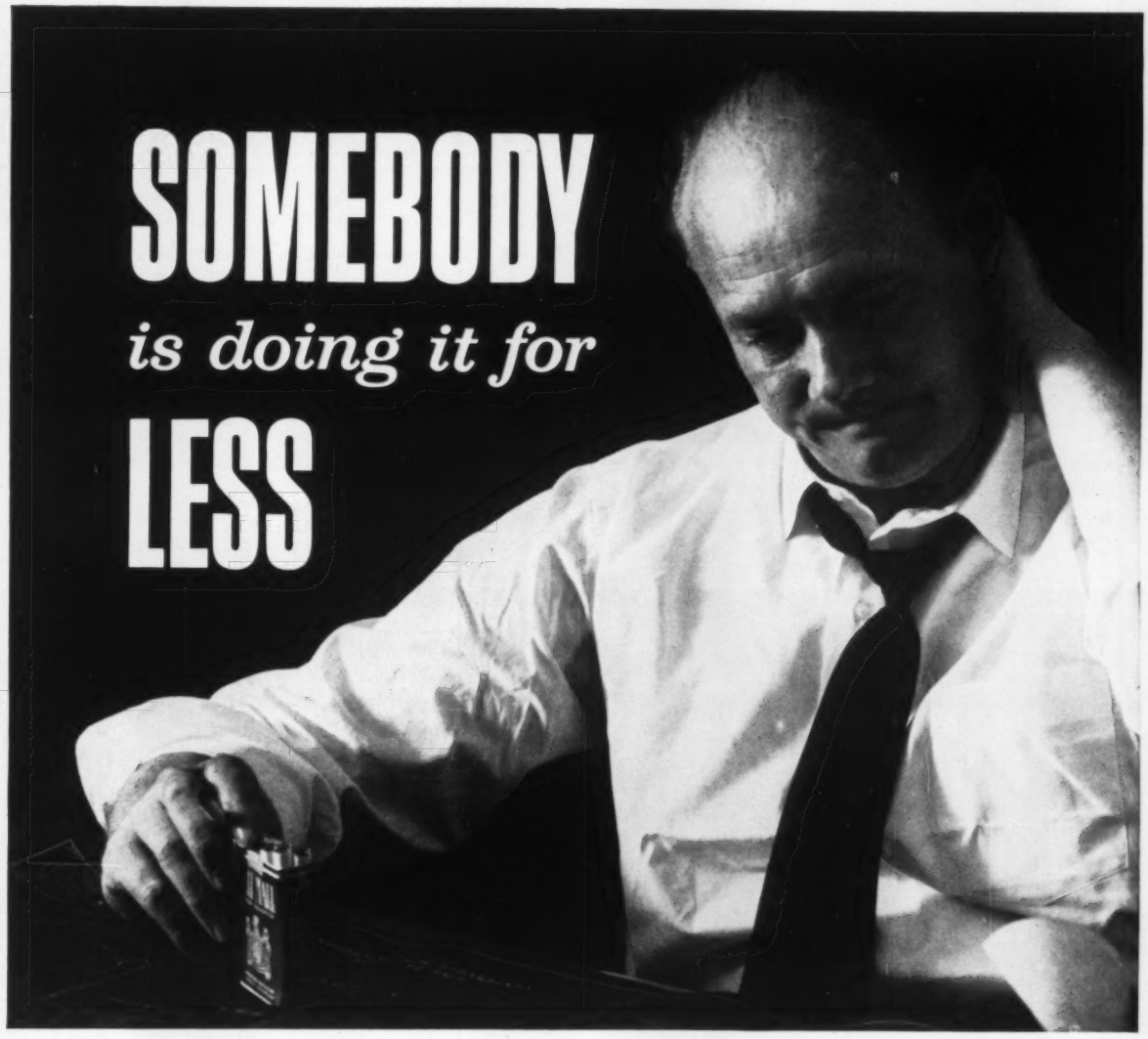


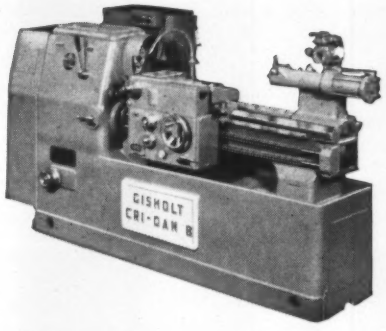
**ROEBLING**
Branch Offices in Principal Cities
John A. Roebling's Sons Division
The Colorado Fuel and Iron Corporation.

**quality inside and outside**

*We put a lot of work into it—*
*You get a lot of work out of it*

# SOMEBODY *is doing it for* LESS






Can you afford to stay with conventional threading methods and pass up savings from 30% to 80%?

These savings can be yours with a Gisholt CRI-DAN High Speed Threading Lathe. Times are drastically reduced. You use single-point carbide tools. *Quality* threads—simple or complex—are produced automatically.

Whether you're threading in lots of 6 or 600, the CRI-DAN method will enable you to do it for less.

**Gisholt CRI-DAN Model B Automatic Threading Lathe**—Sets up in 8-15 minutes. Inexpensive single-point carbide tools produce all types of internal and external threads: single- or multiple-start, coarse or fine, left- or right-hand, straight or tapered, standard or special form—in any material, including new high-tensile, hard alloys.

*Call your Gisholt Representative or write for Catalog 1215.*

**GISHOLT**
**MACHINE COMPANY**
Madison 10, Wisconsin, U.S.A.

**Turret Lathes • Automatic Lathes • Balancers • Superfinishers® • Threading Lathes • Factory-Rebuilt Machines with New-Machine Guarantee**

Steel

# THE IMPELLING URGE

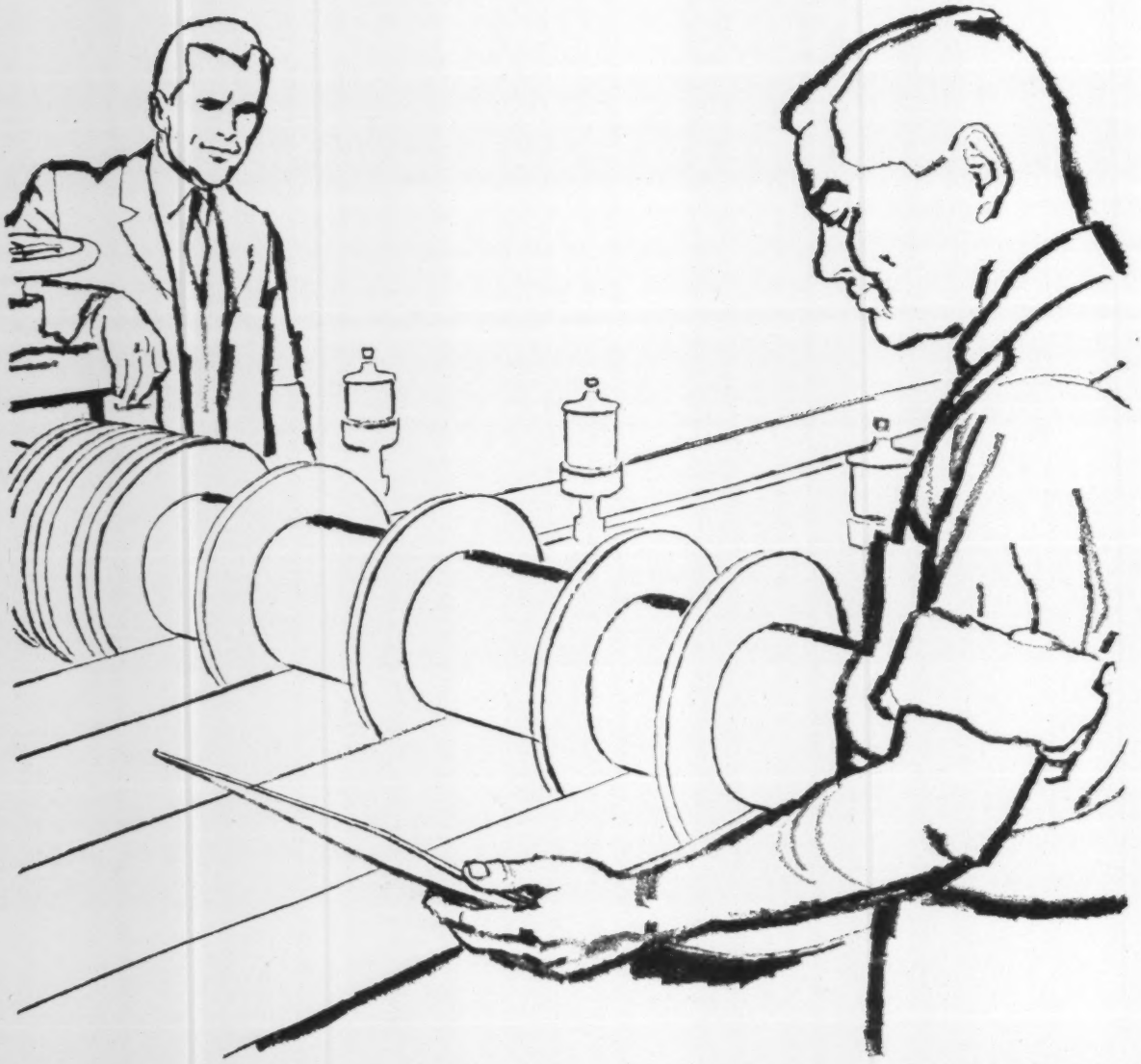
Of a steelmaking specialist. To be a step ahead. In equipment. In versatility ■ Tilt the mammoth electric furnace. Pour the molten stream. Steels for bridges, missiles, refineries and a host of other industrial uses. From a modern electric furnace comes the vast variety of special-duty steels essential to the skilled builders of such vital projects ■ The urge for versatility and product range is a characteristic long associated with Lukens in the making of plate steels. Carbon steels by the thousands of tons. Special-duty clad and alloy steels. Armor steels. Heads and steel plate shapes. It is one of many characteristics that make Lukens—

THE SPECIALIST
IN PLATE STEELS

PHOTOGRAPH BY PAUL WELLER

LUKENS STEEL

COATESVILLE, PA.



## Can you get longer edge life from your SLITTER KNIVES?

# A·S·K for the answer!

**AMERICAN SHEAR KNIFE**

The answer is yes when you use slitter knives from A.S.K. (American Shear Knife Company). A.S.K. Slitter Knives last longer, stand up better under the heaviest jobs, reduce maintenance and replacement costs!

Why? Because A.S.K. has devoted years of research to the selection of proper alloys, and correct techniques in heat treating, precision grinding. For slitter knives that last longer, improve your slitting operation . . . Ask A.S.K.!

**FREE HANDBOOK**—Want a handy reference on the installation, operation and maintenance of slitter, shear and chipper knives? A.S.K. has the answers in an 88-page manual. For free copy, write American Shear Knife Co., Homestead, Pa.

# THE TRADEMARK IS CHANGED

## ...to match the high performance standards of the nation's top-quality electrical control equipment

Soon you will see this new trademark on Clark control devices and systems. Behind this symbol are the precise engineering and exacting production methods which make possible the high standards of quality for which Clark is famed. Behind it are men with the know-how to create the longest lived, sturdiest, most efficient electrical controls. Behind it are answers to your needs for everything from standard equipment such as motor starters, relays and push buttons to complete engineered systems.

For help in solving your control problems, contact your local Clark distributor or district sales office, or write direct. *The Clark Controller Company* • Main Plant: Cleveland 10, O.—Western Plant: Los Angeles 58, California—In Canada: Canadian Controllers, Limited, Toronto, Ont.

# New technique makes possible easy-to-machine steel extrusion dies from molybdenum

At 4600°F thorium becomes a liquid. Bismuth boils. Antimony vaporizes. But molybdenum remains hard.

To help you take advantage of molybdenum's hardness—and heat resistance—Sylvania now makes available molybdenum for forging into extrusion dies for steel, titanium and other metals. Thanks to its new isostatic pressing and sintering operation, molybdenum powder of controlled particle size can be formed into forging blanks that permit you to produce intricate shapes and patterns for your dies. Because of molybdenum's high temperature characteristics, these dies far outlast conventional dies. Sylvania also produces billets and ingots for forging, electrodes for arc casting, blanks for machining and machined parts.

Shouldn't you consider refractory metals in meeting your needs? The same properties that solve the problems of throat inserts for rockets and missiles can work for you in piercing points, die-casting dies and cores, in truing grinding wheels and in many other ways. For the full story or help in checking out a special idea write Chemical & Metallurgical Division, Sylvania Electric Products Inc., Towanda, Pennsylvania.

SYLVANIA

SUBSIDIARY OF
GENERAL TELEPHONE & ELECTRONICS

GENERAL SYSTEM

## Strike Review

**Sir**—While the main body of your review of the United Steelworkers of America booklet "The 1959 Steel Strike" (IA, April 6, '61, p. 9) accurately reflects the contents, the headline and the second sentence are 180 degrees off course.

Your headline is: "USWA: Defends T-H Act." And the second sentence reads "The union defends President Eisenhower's use of the Taft-Hartley injunction . . ."

On the contrary, we explicitly condemn both. The introduction to our booklet contains the following quotation: "Our opposition to the Taft-Hartley Law itself and to its use in the steel strike is well known." On pp. 46-47 the following paragraph appears:

"Taft-Hartley had been invoked some 15 times before; in several instances, before the strike actually took place; in other instances, soon after the strike broke out. Generally, it has been used as a sort of cooling-off period. Never before had it been used in such flagrant aid to one side. The steel strike was almost three months old, and the workers had been suffering. The employers, however, were just beginning to feel the effects of the walkout. And then, just at the moment when the greatest damage to the union and the greatest help to the company would ensue, the President invoked the injunctive powers of the law. The President had come to the rescue of the steel companies. He asserted that he was doing it to protect the national health and safety, but the result was the same."

Do you read this as a defense of "President Eisenhower's use of the Taft-Hartley injunction?"

What we did defend was the American democracy with its division of powers. We pointed out that we too had certain rights, and that we could make use of them in such a way as to help bring about a favorable settlement. For example, by appealing from one court to another up to the Supreme Court, during which time the injunction was held in abeyance, we upset the steel companies' time-table and obtained a strong bargaining lever because the 80-day injunction period was extended into a new cost-of-living adjustment date.

But we also paid our compliments to President Eisenhower for his constitutional behavior. He enforced a law obnoxious to us in a manner helpful to the steel industry. That was his right and unquestionably his honest judgment as to his duty. But he did not abuse his authority. He scrupulously respected all the rights of the union and its membership during the strike. It was this conduct that we praised.—Meyer Bernstein, International Affairs Representative, USWA, Washington, D. C.

## Masterful

**Sir**—Your recent series of articles on industry in Japan and the Japanese-American trade relations setup is just masterful.—Harold McGinnis, Columbia, S. C.

**"Look up at our founder, Keesey. If he nods his head, you get your raise."**

CALL
Southern FOR
EXCEPTIONAL SERVICE
on FINE FASTENERS

Southern Screw is prepared to go to almost any means to guard its reputation for service.

When it takes some extra hustle to meet your delivery requirements, you'll find that Southern is a specialist in service as well as in quality.

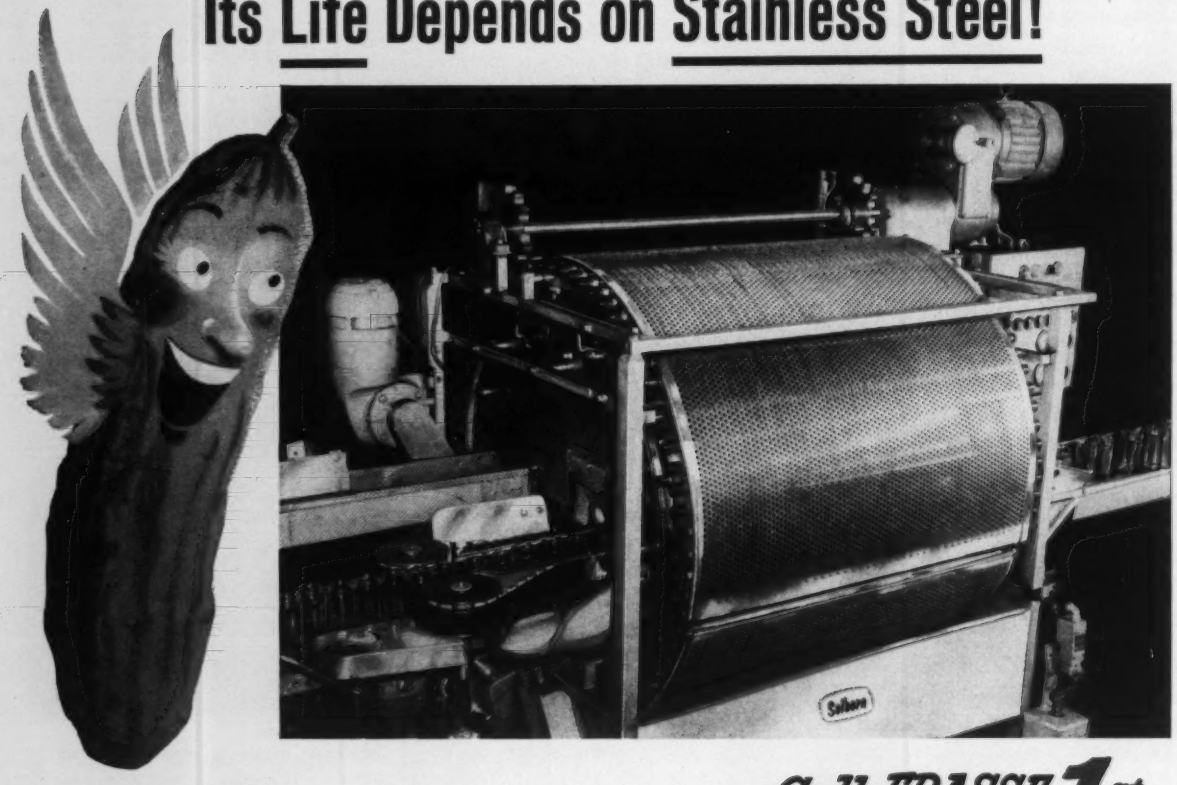
If you need fasteners in a hurry, call your Southern distributor, or write Southern Screw Company, P. O. Box 1360, Statesville, N. C.

Machine Screws & Nuts • Tapping Screws • Stove Bolts • Drive Screws Carriage Bolts • Continuous Threaded Studs • Wood Screws

Manufacturing and Main Stock in Statesville, North Carolina

WAREHOUSES:
New York • Chicago • Dallas • Los Angeles

# Meet the "Pickle Packer"—
# Its Life Depends on Stainless Steel!



Pickles fly when this ingenious "Pickle Packer" goes into action. With unbelievable precision it packs 6,000 a *minute*—fills 18,000 jars an hour ...even guarantees full measure in the bargain. Seven times faster than previous methods...it's far less costly!

*Despite corrosive brine, trouble-free operation and long life pose no problem...the "Pickle Packer" is completely made of corrosion resistant stainless steel. Stainless steel protects product purity—is easily cleaned ...meets sanitary codes.*

Stainless steel bars, angles, sheets, plates, tubing and pipe are used in the "packer"...yet *every* item is shipped *from stock* by Frasse. Frasse carries every rolled form—in a wide range of sizes and analyses...has a wealth of know-how in applying stainless to *build sales.*

Think your product can use more *life*—and the built-in sales appeal of stainless steel? You'll profit by a call to Frasse.

***Call FRASSE 1st for***

## COMPLETE

## STAINLESS STEEL SERVICE

| | |
|---|---|
| **Bars** | **Forgings** |
| **Sheets** | **Strip** |
| **Plates** | **Tubing** |
| **Pipe** | **Wire** |
| **Fittings** | **Valves** |

**Peter A. Frasse & Co., Inc.**

STEEL SERVICE CENTER INSTITUTE

| New York 13, N. Y. | Philadelphia 29, Pa. | Buffalo 5, N. Y. | Syracuse 1, N. Y. | Hartford 1, Conn. |
|---|---|---|---|---|
| 17 Grand St. | 3911 Wissahickon Ave. | P. O. Box 102 | P. O. Box 1267 | P. O. Box 1949 |
| WAlker 5-2200 | BAldwin 9-9900 | TR 6-4700 | HOward 3-8655 | JAckson 9-6861 |

## Tool Show Preview

This week's issue of IRON AGE salutes the pending Tool Engineers' Show in New York City.

Coming four weeks before the ASTME Conference and Exposition (May 22-May 26), it's a complete show guide.

A preview of the new products, equipment and materials featured begins on p. 136. There's a rundown on the program and the technical sessions (p. 150). And an alphabetical listing of exhibitors starts on p. 155.

**Machining Feature** — Also featured in this Tool Show issue is an eight-page article on the machining of hard steels. Authored by Ralph Eshelman, our machinery editor, it covers the latest techniques in turning, milling, drilling, shaping, and other machining of these metals.

But, rather than describe it further, we recommend you turn to p. 101 and read it.

## Moving Up

Last week we were pleased to note that John Dykstra was named president of the Ford Motor Co. Our pleasure was not just because we know his reputation, earned in his previous position as vice president, manufacturing.

If you have a copy of the Nov. 10, 1960, issue of IRON AGE in your library, you can see Mr. Dykstra on the cover, along with Ford's vice president, engineering and research, Dr. Andrew Kucher.

In our special report that week, we quoted Mr. Dykstra extensively on the concept of "reliability" and the new stress industry is putting on product reliability.

**Decision Maker**—We don't mean to imply that our cover got Mr. Dykstra his promotion. But it does confirm our philosophy of reporting. We go to the people who are working on industry's most important problems.

So, while we're happy for Mr. Dykstra, we don't mind pointing out our own good editorial judgment in reporting the views of Mr. Dykstra and others who are getting things done in industry.

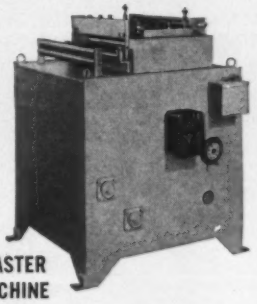
**ON THE JOB:** When this picture was taken for the Nov. 10, 1960, IRON AGE cover, John Dykstra (r) was Ford Motor Co. vice president, manufacturing. Last week he became president of the company. Man on left is Dr. Andrew Kucher, Ford's vice president, engineering and research.


*What's NEW in Press Room Equipment?*

See these **benchmasters** for **improved feeding, better low-cost production!**

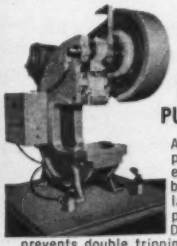
**BENCHMASTER "MAF" MACHINE**

**Motorized Automatic Feeding (MAF) Machines** supply uniform measured lengths of flat strip or coil stock to any secondary machine. They cycle either manually or by linking to a machine for automatic feed. Stock is pulled from a reel, or preferably, from a KOIL-KRADLE slack loop. Feed length is adjustable from 3" to 60". Stock widths up to 12" wide. Other capacities on special order.



**BENCHMASTER "FS" MACHINE**

**The Combination Length-Feeding and Straightening (FS) Machine** automatically straightens flat strip or coiled stock and supplies measured lengths to a secondary machine. It also pulls from a reel or KOIL-KRADLE slack loop. By first removing curl, kinks, etc., stock feeds faster with greater accuracy, improves production and quality of parts.



**IMPROVED BENCHMASTER ELECTRO-MAGNETIC PUNCH PRESS CLUTCH**

A safe, manual or automatic punch press clutch that eliminates sliding keys, breakage hazards and time lag . . . pickup occurs at any part of flywheel rotation. Dual purpose cam switch prevents double tripping. Single trips or operates continuously. Other electrical control settings for manual set-ups, foot control, 2 button hand control or automatic operation.

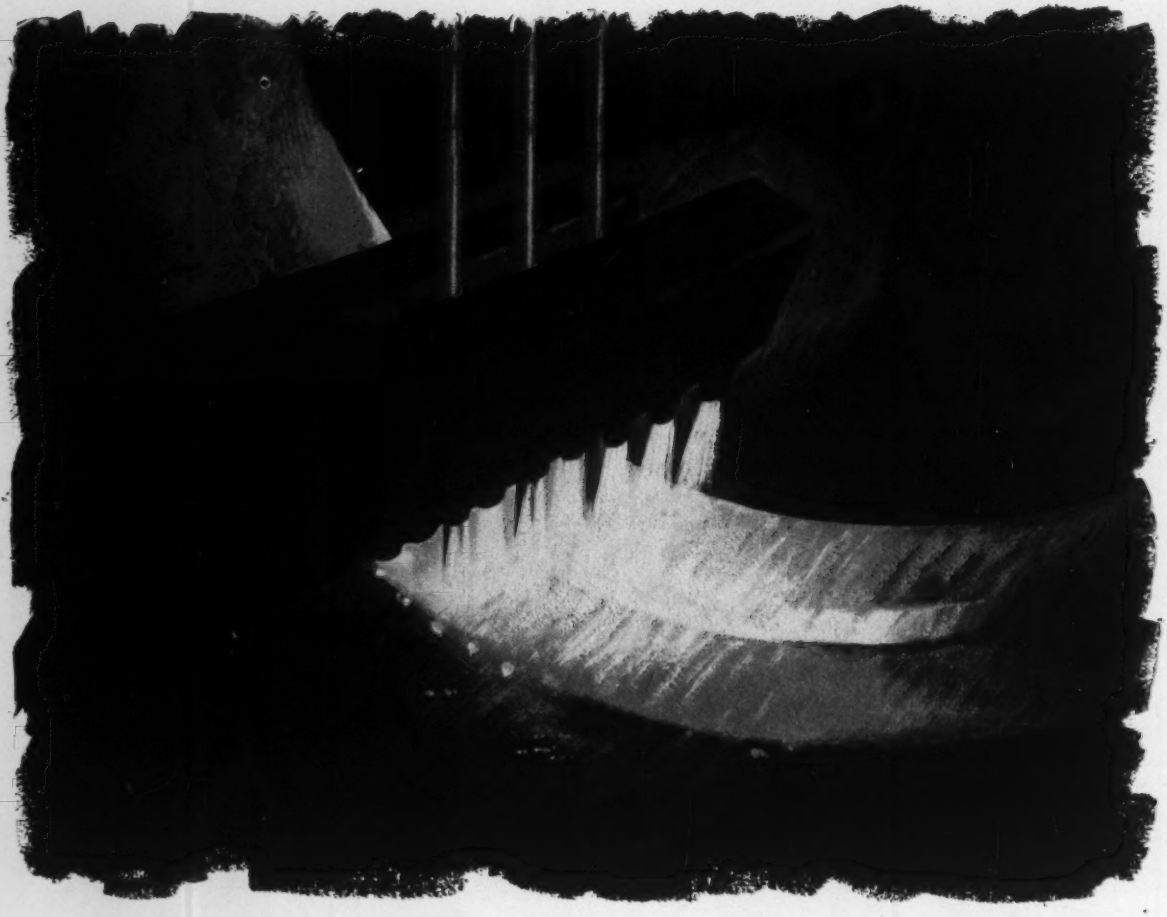
Also available:
Air Clutch and Mechanical Clutch Equipped Presses.

FREE LITERATURE—WRITE TODAY!

**benchmaster**

World's largest manufacturer of small punch presses and mills.

1835 W. Rosecrans Avenue • Gardena, California



# *Lower costs with mechanized hard-facing*

Speed up the hard-facing operations in your plant with HAYNES Hard-Facing Machines . . . and enjoy substantial savings. Mechanized hard-facing is fast. It produces sound, uniform deposits on a production basis. And it requires less alloy per part hard-faced.

Mechanized deposits conform closely to specified requirements. As a result there are fewer rejects. The machines maintain adequate preheat, proper proportioning of welding flames, and a continuous supply of molten metal. Gas consumption per part is lower. A minimum of manual effort is needed to turn out high-quality hard-faced parts.

Our field engineers can help you determine which of your hard-facing jobs are suitable for mechanization. For full information on HAYNES Hard-Facing Machines and on the wide range of HAYNES Hard-Facing Alloys, write our general sales office in Kokomo, Indiana.

**For a closer look**

Send today for this important manual, "Mechanized Hard-Facing." Find out more about this production method.

**HAYNES**
**ALLOYS**

**HAYNES STELLITE COMPANY**
*Division of Union Carbide Corporation*
Kokomo, Indiana

UNION CARBIDE

The terms "Haynes" and "Union Carbide" are registered trade-marks of Union Carbide Corporation.

## COMING EXHIBITS

**Castings Show**—May 8-12, Brooks Hall, San Francisco, Calif. (American Foundrymen's Society, Golf & Wolf Rds., Des Plaines, Ill.)

**Material Handling Institute Eastern States Show**—May 9-11, Trade and Convention Center, Philadelphia.

**Design Engineering Show** — May 22-25, Detroit Coliseum.

**Tool Show**—May 22-26, American Society of Tool and Manufacturing Engineers, New York Coliseum. (Society headquarters, 10700 Puritan, Detroit 38, Mich.)

## MEETINGS

### APRIL

**Scientific Apparatus Makers Assn.** —Annual meeting, Apr. 23-27, The Greenbrier, White Sulphur Springs, W. Va. Association headquarters, 20 N. Wacker Dr., Chicago.

**Institute of Radio Engineers**—Annual conference, April 26, 27, and 28, Westward Ho Motel, 618 North Central Ave., Phoenix, Arizona.

**Society of the Plastics Industry, Inc.** —18th annual western section conference, Apr. 26-28, Hotel del Coronado, Coronado, Calif. Society headquarters, 250 Park Ave., New York 17, N. Y.

**National Screw Machine Products Assn.** — Annual industry meeting, Apr. 30 - May 3, Somerset Hotel, Boston, Mass. Association headquarters, 2860 E. 130th St., Cleveland, O.

### MAY

**American Zinc Institute, Inc.**— 43rd meeting, May 1-2, Drake Hotel, Chicago.

**Lead Industries Assn.** — Annual meeting, May 2-3, Drake Hotel, Chicago. Assn. headquarters, 292 Madison Ave., New York 17.

**(Continued on P. 30)**


# "CALL FOSTER... THEY'LL SHIP PIPE PLUS"

Right! Whether it's a routine order or an emergency request for unusual or hard-to-get sizes, Foster gives you pipe "*plus.*"

You get all your pipe when and where you need it, cut to length or fabricated in complete-package shipments, at lowest possible cost.

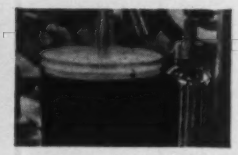
For non-pressure applications, check the unusual savings on Foster Structural Pipe. Foster's nationwide warehouses stock Tested & Structural Steel Pipe, 1/8" through 48" in all sizes and walls—"*plus*" Stainless, Seamless, Alloy, Pressure, Aluminum, Wrought Iron, PVC Pipe and Valves, Fittings, Flanges.

Write **L. B. FOSTER CO.** for latest Stock List IA-4

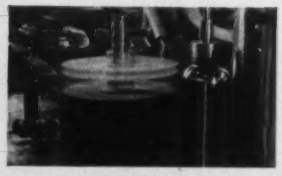
PITTSBURGH 30 • NEW YORK 7 • CHICAGO 4
HOUSTON 2 • LOS ANGELES 5 • ATLANTA 8

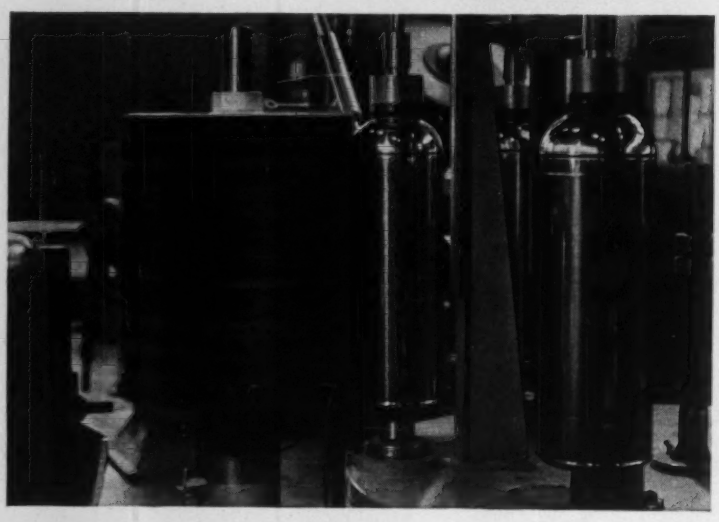
***Faster From Foster***

*PIPE • PILING • RAIL*



ACME IN ACTION

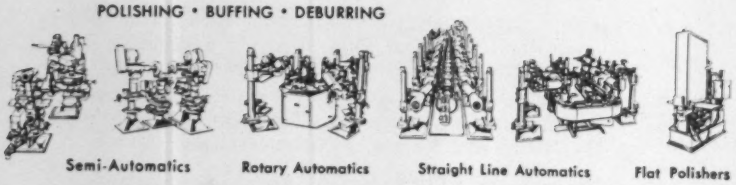




Doing more work with
*Movement and Motion*

Ever see an Acme automatic polishing and buffing machine in action? If not, you ought to—the sooner the better. It's bound to give you some new ideas about the versatility of mechanical movements and motions. Progressive ideas, too, about how they can be applied to do more work—better and faster—in finishing every conceivable type of part. Large or small—simple or complex. Drawn, spun, extruded—die-cast, forged or machined. Yes, you name it and Acme engineers will quickly demonstrate the kind of action required to improve quality and reduce your finishing costs. Why not send samples of your "problem" parts today for analysis and recommendations? No cost, no obligation.

POLISHING • BUFFING • DEBURRING



Semi-Automatics | Rotary Automatics | Straight Line Automatics | Flat Polishers

Comprehensive catalogs available upon request. Write, wire or call:

**ACME MANUFACTURING COMPANY**

1400 E. 9 Mile Road • Detroit 20 (Ferndale), Michigan • JOrdan 6-1550

*Leading Producers of Automatic Polishing, Buffing and Deburring Machines Since 1910*


## MEETINGS

**(Continued from P. 29)**

**American Rocket Society** — Oak Ridge National Laboratory, Space Nuclear Conference, May 3 - 5, Gatlinburg, Tenn.

**National Machine Tool Builders Assn.**—Spring Meeting, May 4-5, Edgewater Beach Hotel, Chicago. Assn. headquarters, 2139 Wisconsin Ave., N. W., Washington.

**Ductile Iron Society**—Annual Meeting, May 8-13, San Francisco. Society headquarters, P. O. Box 858, Cleveland.

**American Foundrymen's Society**—65th annual castings congress & exposition, May 8-12, Brooks Hall, Civic Auditorium, San Francisco. Society headquarters, Golf and Wolf Rds., Des Plaines, Ill.

**Die Casting and Permanent Mold Div., American Foundrymen's Society**—4th annual program, May 11-12, Sheraton-Palace Hotel, San Francisco.

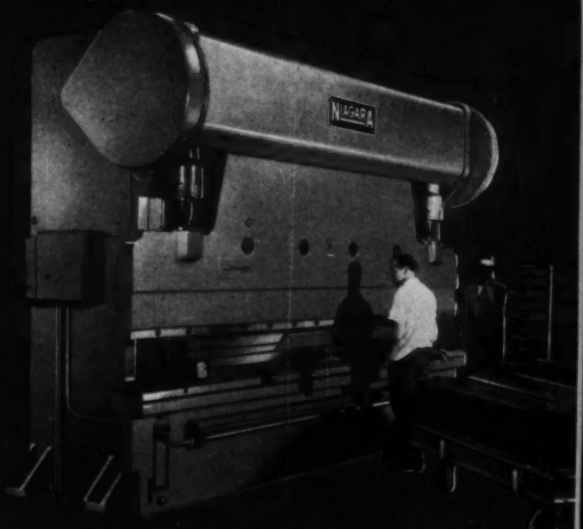
**National Assn. of Secondary Material Industries, Inc.** — Atlantic Div., regional meeting, May 11, Roosevelt Hotel, New York, N. Y. Assn. Offices, 271 Madison Ave., New York 16, N. Y.

**Copper & Brass Research Assn.**—Annual meeting, May 14-17, The Homestead, Hot Springs, Va. Assn. headquarters, 420 Lexington Ave., New York.

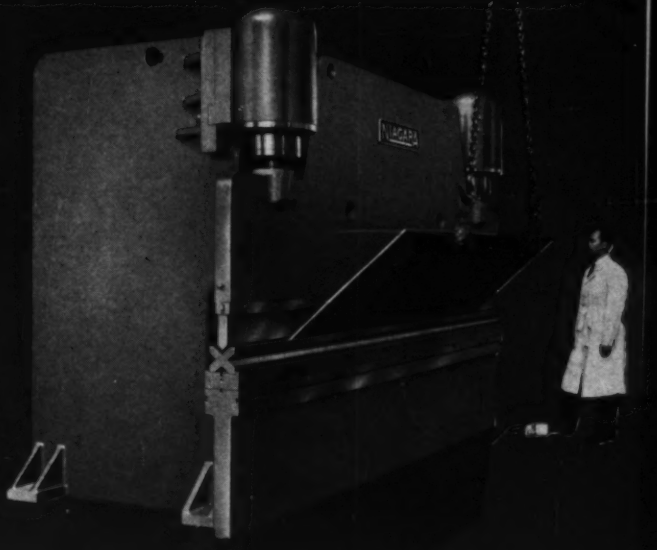
**Steel Service Center Institute**—Annual Meeting, May 14-17, Statler-Hilton Hotel, Washington, D. C. Institute headquarters, 540 Terminal Tower, Cleveland.

**Machinery Dealers National Assn.**—Annual Convention, May 15-18, Shoreham Hotel, Washington, D. C. Assn. headquarters, 1346 Connecticut Ave., N. W., Washington, D. C.

**American Mining Congress**—Coal Convention & Exposition, May 15-18, Cleveland.



# MAKE THE RIGHT DECISION
## from the line that means the most



With men who know their press brakes, Niagara means the most. Mechanical or hydraulic, there's a tremendous choice of sizes and bending capacities in a 15-1000 ton range. From 121 models, you're sure to make the right press brake decision.

Yes, you'll find it pays to talk "press brakes" with Niagara . . . for here you'll be talking with press brake people who not only build them all, but take pride in building them *best of all.*

Niagara can be your die headquarters too. "Standards" in stock . . . "specials" to order.

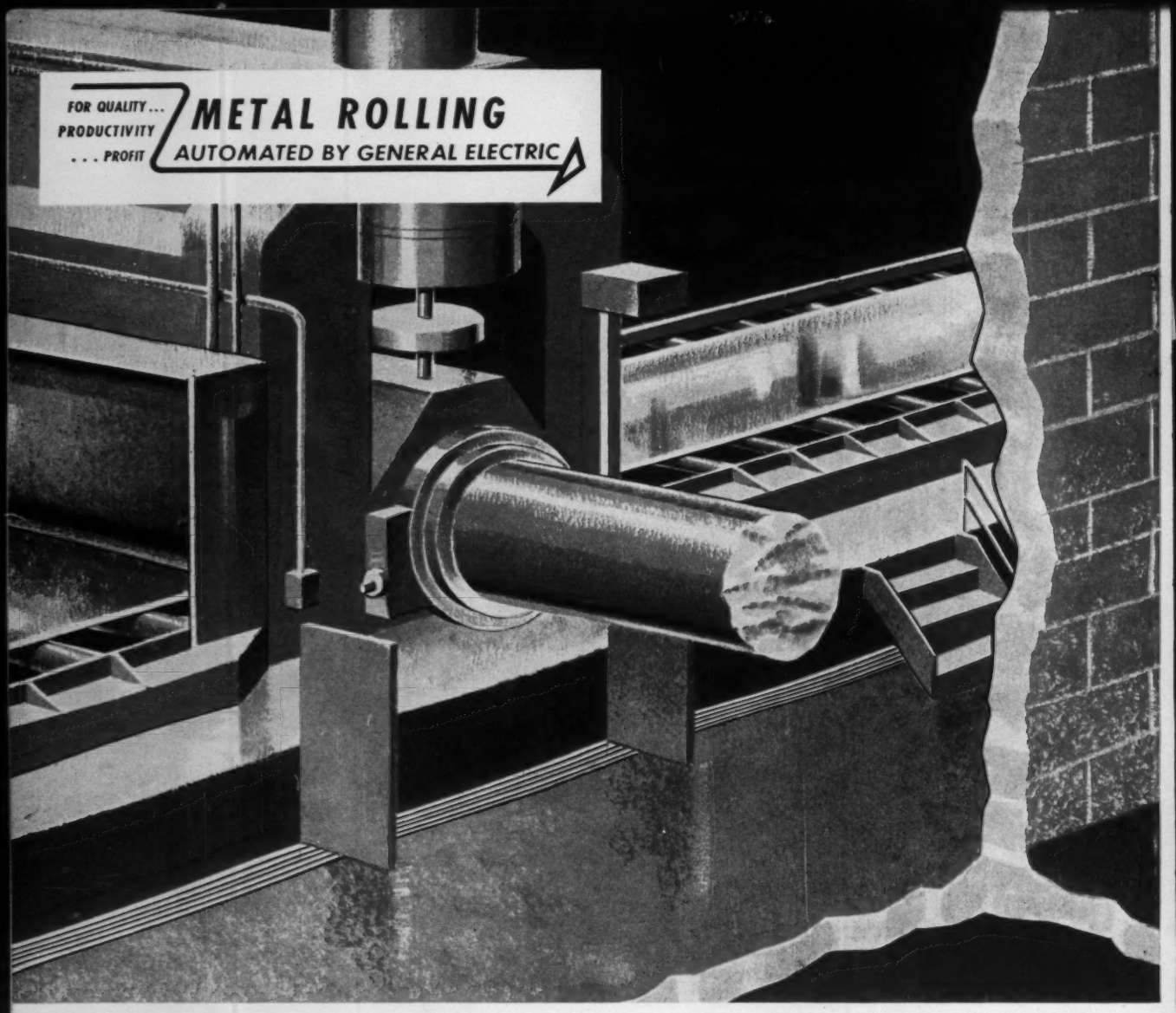
You're invited to check the Niagara Press Brake story . . . in fullest detail. Write for these illustrated bulletins.

| | |
|---|---|
| 15, 30, 60 ton — Mechanical | Bulletin 90 |
| 90 thru 1000 ton — Mechanical | Bulletin 89 |
| 200 thru 1000 ton — Hydraulic | Bulletin 91 |
| Dies | Bulletin 92 |

# NIAGARA
# PRESS BRAKES
## mechanical and hydraulic

**NIAGARA MACHINE & TOOL WORKS, BUFFALO 11, N. Y.**
District Offices and Distributors everywhere.

America's most complete line of presses, press brakes, shears, other machines and tools for plate and sheet metal work.




## GENERAL ELECTRIC CONTROL FOR STEEL MILLS

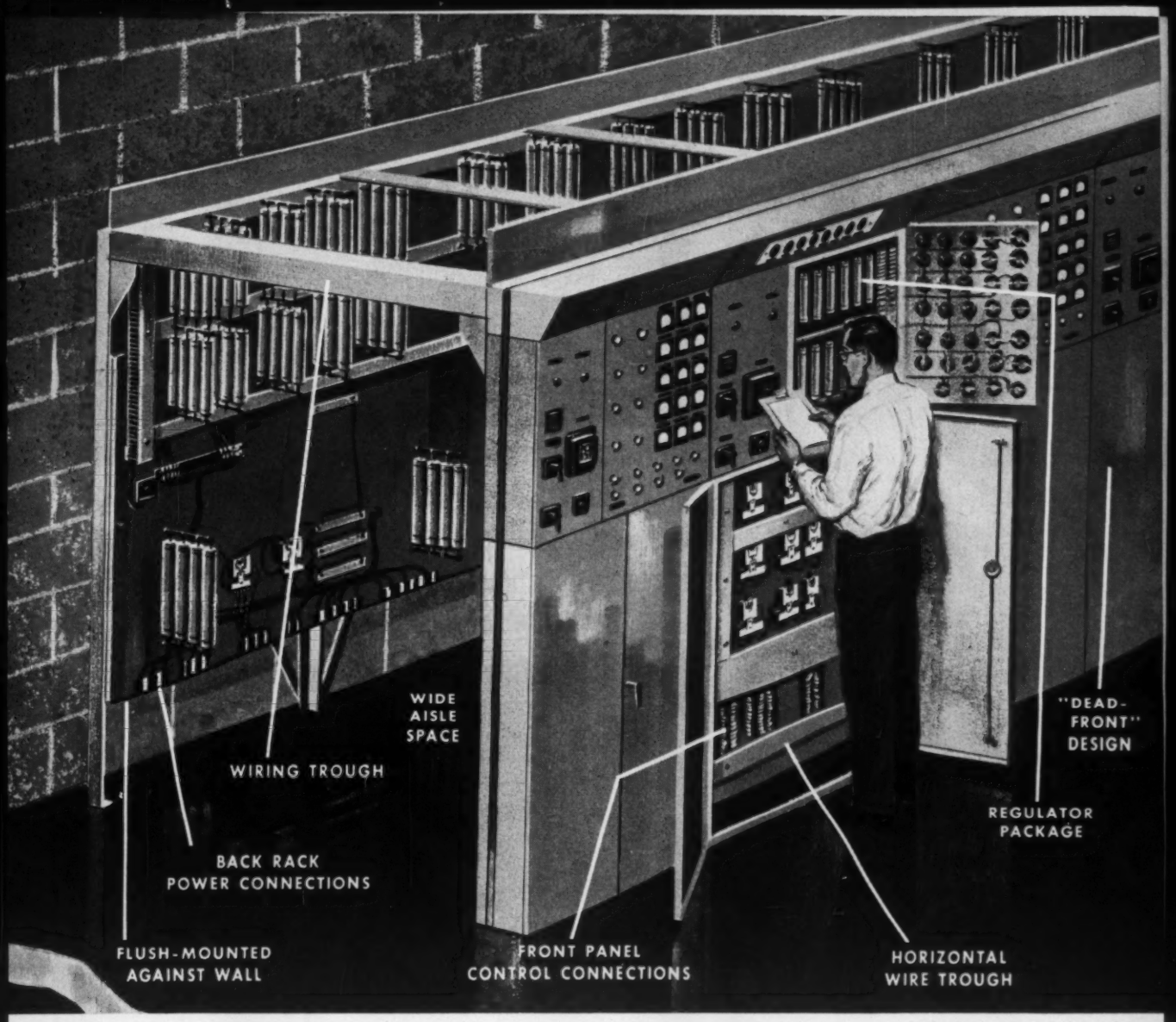
# New control panels cut connection

General Electric has redesigned its industry-proved, heavy-duty, steel mill control panels—adding features to permit greater utilization of mill space . . . to save you time and money in installation and maintenance . . . and increase safety for operating personnel. The following cost-cutting and work-saving benefits tell the story of these new panels:

**Reduced floor space**—Compact design of this new panel cuts floor space needs up to 35 percent. More efficient arrangement of components provides added room for work inside the panel, yet reduces panel length. All incoming wires for control terminate at the front of the panel. All power wiring, including customer power connections, is isolated on the back rack. Use of welded studs and cage nuts permits installation against a wall —no need for additional work space behind panel. This saving in space means that valuable floor area can be used for other purposes, or construction costs of new buildings can be reduced.

**Easier field connections**—Installation wiring time is reduced as much as 50 percent by improved wiring layout. All incoming control wiring is brought to the front of the panel. A horizontal wire trough is available to the contractor to facilitate wiring to proper terminals and eliminate cord-tying bundles of wires in the field. Doors on the front of the panel open for access to terminal boards. For quick identification, terminal designations are permanently ingrained on the terminal board and into high-quality, plastic sleeves on each wire end.

**Simplifed maintenance**—Wide aisle between front panel and back rack makes maintenance easier and safer. Devices on front panel and back rack are connected *from the maintenance aisle,* allowing work from only




# time 50%, required floor space 35%

one location. On the regulator package, fine-tuning adjustments are easier since potentiometers are located next to their related meters.

**Increased safety**—Since power wiring and all field power connections are isolated on the back rack, operating personnel are protected from accidental contact with high voltage. "Dead-front" construction, utilizing regulator packages and front panel devices behind doors, affords additional protection.

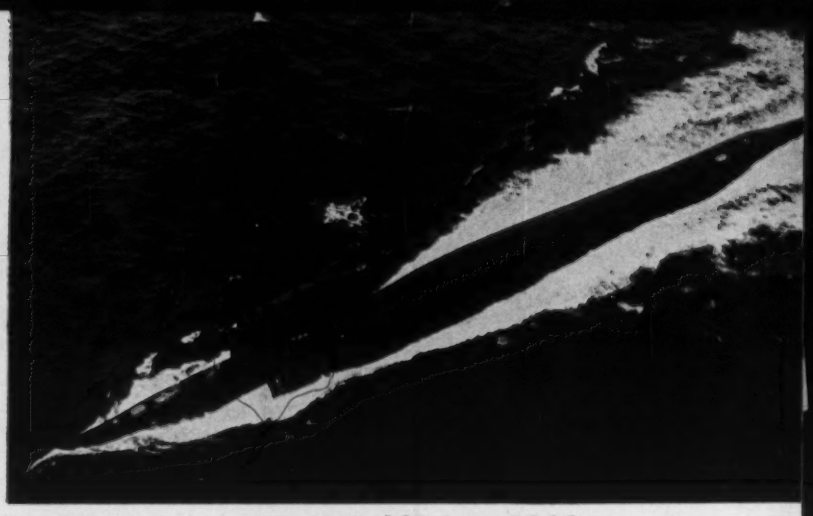
**Improved appearance**—All-steel bases provide rugged construction and uniform panel shape. Packaging of equipment into functional components and placement of contactors and relays behind doors give straight-line, modern appearance to panels.

For details on these steel-mill control panels, see your G-E Sales Engineer. Or write Sect. 785-13, General Electric Co., Schenectady, N. Y. for Bulletin GEA-6701. *Industry Control Dept., Salem, Va.*

*Progress Is Our Most Important Product*

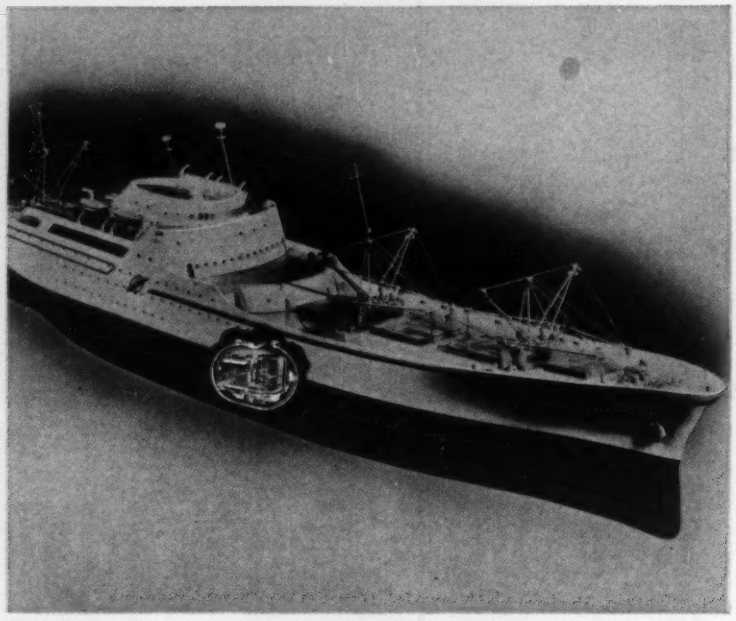
GENERAL ELECTRIC

**A company's reputation** hangs on many things, including door hinges. This washer maker uses Stainless 430 Wire from Carpenter Webb Wire Division.



**World's largest submarine,** 447-foot, 5900-ton, atom-powered Triton, serves as early warning station for U.S. Navy task forces. Incorporated into its design for extra reliability are periscope mountings forged from Carpenter Stainless No. 4A (Type 304) Steel.

**Family begs for eggs,** thanks to this automatic skillet. Carpenter Low Expansion "42" Alloy in thermostat assures even temperatures...and tempers.



**World's first nuclear-powered merchant ship,** N.S. Savannah, will cruise for over 350,000 miles on one atomic fueling. The fuel assemblies for the Savannah power reactor contain 121 fuel rods clad in dependable Carpenter Type 304 Stainless Tubing.

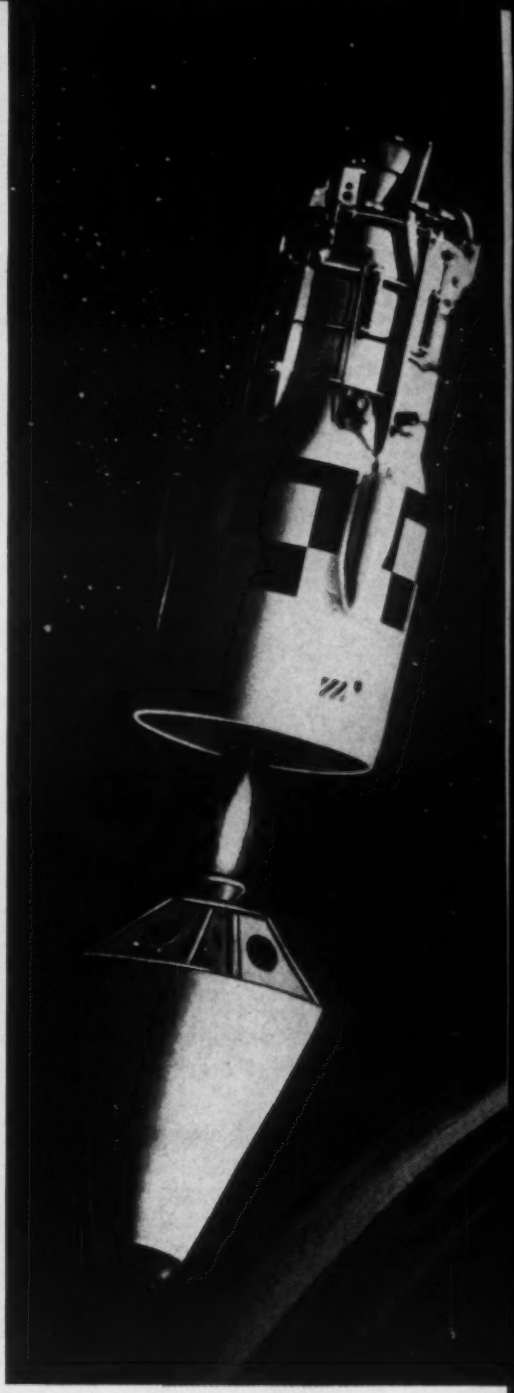
Steel

**you can do it consistently better with**

The Carpenter Steel Company, Main Office and Mills, Reading, Pa. / Export Dept., Port Washington, N.Y.—"CARSTEELCO"

**Everything adds up...** to extra reliability in this famous-make bookkeeping machine. Contributing to its reliability are components shaped from Carpenter TGS Tool Steel. Again and again, wherever you find reliability a factor, Carpenter is first choice.

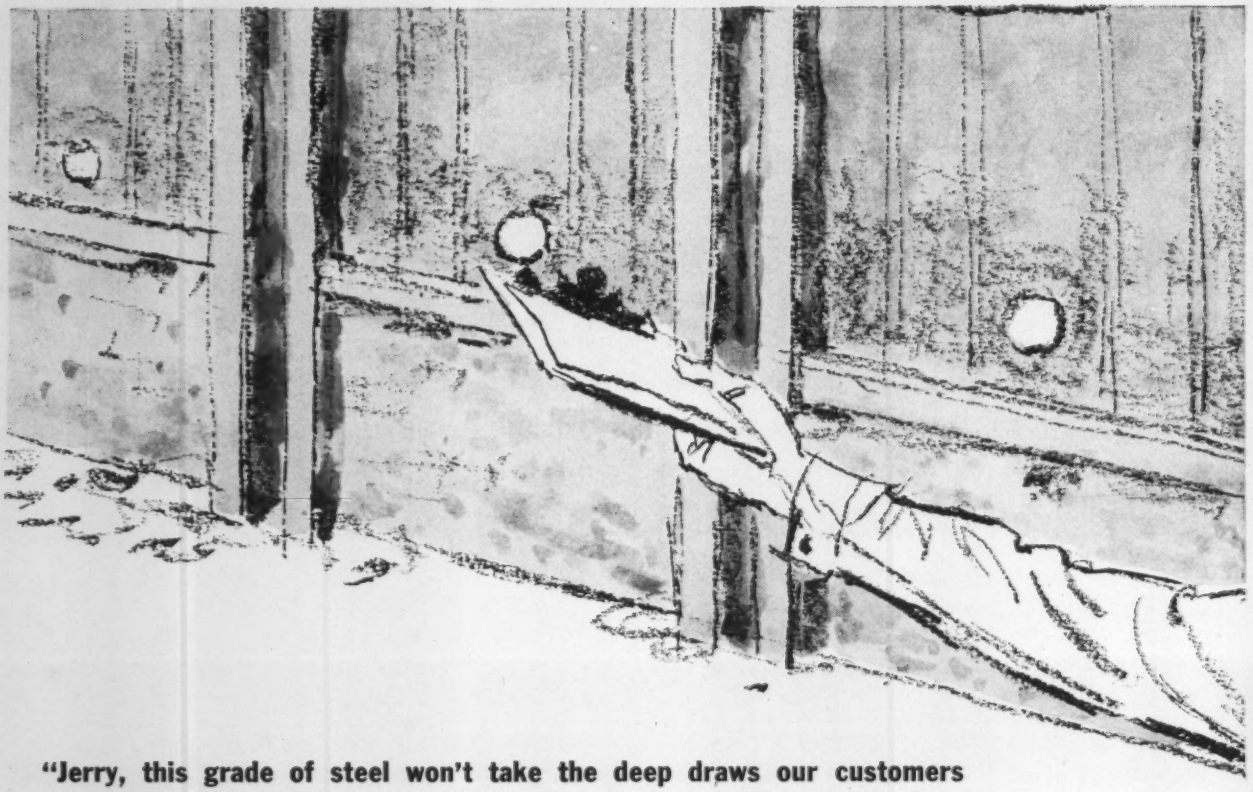
**Research that profits you!** From Carpenter's metallurgical laboratories come new tool steels to meet the demands of industry. Latest example: HI SHOCK 60 for applications involving extreme shock resistance. Now stocked for immediate deliveries.



**Sets the pace in space!** The "Discoverer" scores high on predictable performance. Used forgings of Carpenter High Temperature N-155 Alloy.

## *Carpenter* Specialty Steels for Specialists

Alloy Tube Division, Union, N.J. / Webb Wire Division, New Brunswick, N.J. / Carpenter Steel of New England, Inc., Bridgeport, Conn.



**"Jerry, this grade of steel won't take the deep draws our customers demand these days. What we need is lower carbon and silicon levels. Ever used Electromanganese?"**

**"No, but I've talked with the Foote people. They say Electromanganese improves ductility, and sometimes even cuts furnace time. This is hard to believe. Why don't you fellows in Metallurgy let them prove it?"**

**We'd welcome the opportunity!** We believe we can suggest ways to help you produce higher-quality steel, and perhaps even cut costs doing so. From the moment you add it to the ladle, Foote Electromanganese® puts you ahead. Because the addition of impurities is held to a minimum. Carbon, silicon, phosphorus are barely there. Electromanganese is pure—99.9% pure electrolytic manganese. While Electromanganese may increase ingot cost slightly, actual furnace time may go down . . . Electromanganese lends a hand by controlling carbon content.

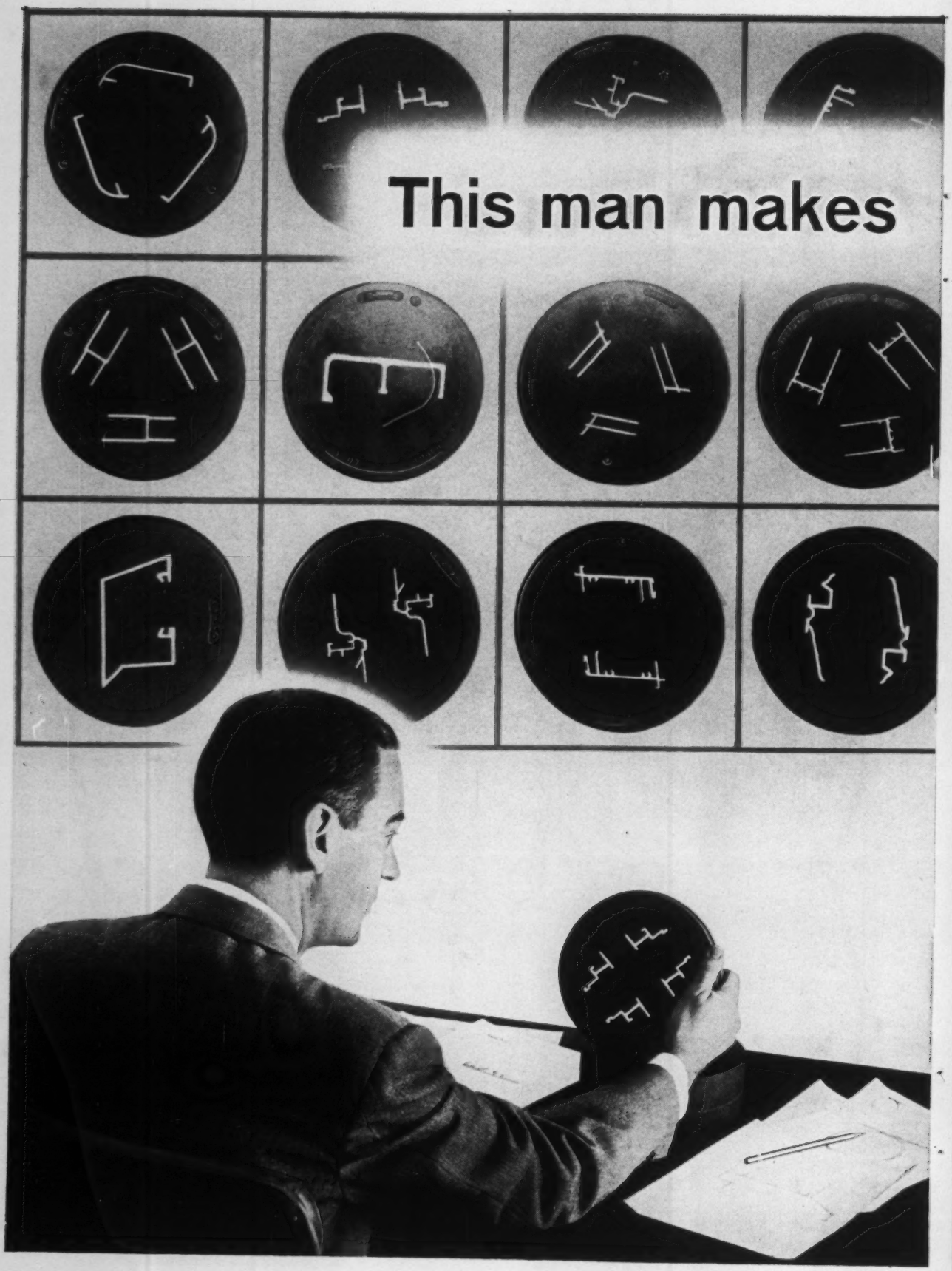
Almost perfect freedom from contaminants helps quality, starting with superior ductility. The big advantages here are improved annealing practices for you, better drawing characteristics for your customer.

And watch those reject rates go down. All along the way, quality goes up, costs drop. And that means after the steel is shipped, too. Returns will be fewer, breakage claims less.

We'd like the opportunity to demonstrate further what we say. Allow us to look at your specific problem with you—whether it's in aluminum-killed, rimming, free-machining or stainless steels. Write for Bulletin 201 which more fully explores advantages of Foote Electromanganese. Foote Mineral Company, 438 West Chelten Ave., Philadelphia 44, Pennsylvania.

FOOTE
MINERAL COMPANY

C. S.


This man makes

# aluminum extrusions in any shape you need!

## He's your nearby independent extruder... Supplied with quality ALCAN aluminum by Aluminium Limited

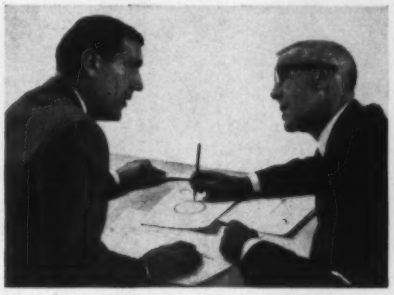
Like so many manufacturers, you may find your best source of precision-made aluminum extrusions is local . . . an independent extruder near your plant!

A specialist in aluminum and in the extrusion process, he can be a big help in engineering and design . . . producing the precision-made parts you need to your most exacting requirements. As for alloys, he offers you a wide range of aluminum alloys formulated by Aluminium Limited for specific end-product requirements.

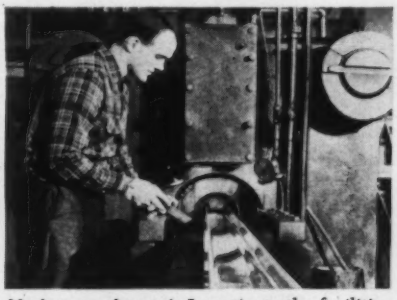
Your nearby extruder also offers more attentive, more personalized service. Even on your smallest order, he gives you the quality, delivery and unit cost that assure your repeat business.

Call in your aluminum extruder on your next semi-fab order. Let him estimate on cost and delivery. Or, if you prefer, we'll be pleased to send you a list of leading extruders in your area.

**Fast, reliable delivery.** Because he's nearer to your plant, your aluminum extruder can arrange production schedules to suit your needs. He can also work more closely with you in estimating, planning and engineering.



**Design help.** Your nearby aluminum extruder is an aluminum specialist. Years of experience qualify him to help you develop the semi-fabricated aluminum shape best suited to economical fabrication and efficient performance of your product.



**Modern equipment.** Investigate the facilities offered by your aluminum fabricator—you'll find him well equipped to serve you. His facilities, experience, location, and his personalized service make him your best source of semi-fabricated aluminum products.

**Aluminium Limited**

ALCAN

In the U.S.—Aluminium Limited Sales, Inc.
630 Fifth Avenue, New York 20, N. Y.
CLEVELAND • CHICAGO • LOS ANGELES
DETROIT • ATLANTA • ST. LOUIS

Aluminium Limited Sales, Inc., Dept. IA-427
630 Fifth Avenue, New York 20, N. Y.

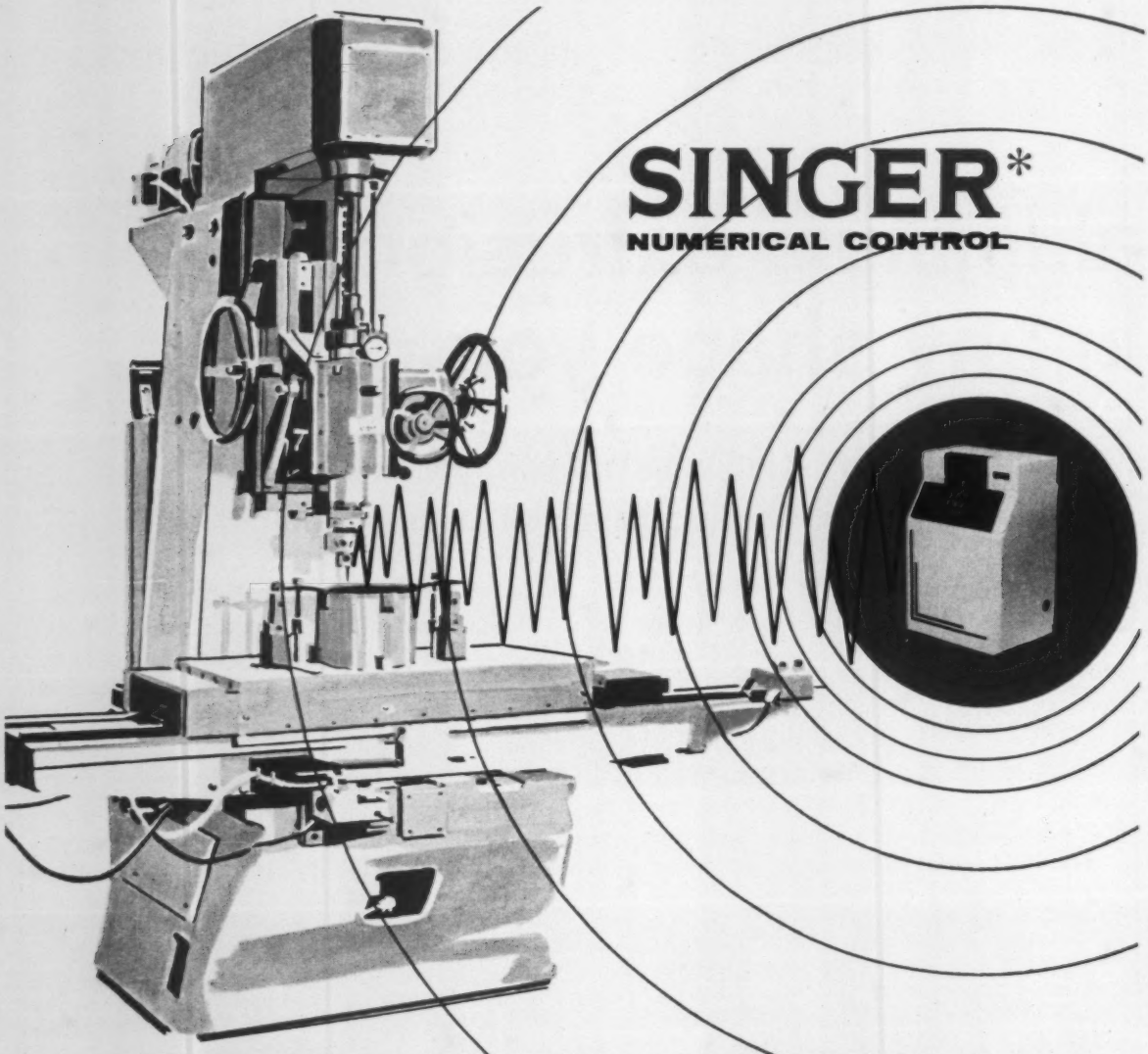
Gentlemen: Kindly send me a list of independent aluminum extruders in my area.

Name_____ Title_____

Firm_____

Address_____

City_____ Zone____ State_____



# SINGER*
## NUMERICAL CONTROL

# A DYNAMIC NERVE CENTER FOR THE MACHINE TOOL INDUSTRY

A SINGER Achievement . . . the most direct approach to point-to-point positioning yet conceived. The SINGER Numerical Control System offers simplicity, reliability and economy, reducing costs of maintenance, labor and down-time.

DISCRETE POSITIONING: UP TO 40″ OF TRAVEL, ACCURACY OF .001

SINGER Numerical Control makes possible a high degree of accuracy by a division of the measuring section and the motor drive within the system.

The SINGER System also features *modular design*, making it possible to assemble basic units in a variety of control systems.

And, of prime importance, all modules and motors are designed, serviced and built by Diehl Manufacturing Company, a SINGER subsidiary.

To see SINGER Numerical Control in action, visit the unique demonstration room at the Diehl Plant near Somerville, New Jersey. Here you can examine actual production records as evidence of the economy, reliability and accuracy of this advanced point-to-point positioning system. Call or write for an appointment at the address below.

Diehl†

**DIEHL MANUFACTURING COMPANY**

SUBSIDIARY OF THE SINGER MANUFACTURING COMPANY

Finderne Plant, Somerville, New Jersey

Telephone: Randolph 5-2200

*A Trademark of THE SINGER MANUFACTURING COMPANY

†A Trademark of THE DIEHL MANUFACTURING COMPANY

These 4 Voss Inverted Roller Levelers are in final assembly. Soon they'll be at work in varied applications ranging from galvanized and hot and cold rolled to plate and high yield missile stock. Each of these companies, already a user of Voss Levelers, know they obtain precise area control and equal to or better than stretcher leveler flatness at high production speeds. Let Voss put 30 years of leveling and flattening experience to work for you.

*Call or write today! We'll be glad to arrange a demonstration without obligation.*

**Voss ENGINEERING CO.**

*7301 Penn Ave. Pittsburgh 8, Pa. Churchill 2-4422*

*How the Foundry Industry Serves America . . . #14 of a Series*

# SHOULD A MATERIAL BE LIGHT OR RIGHT?

The properties of cast iron make it practically ideal for a great many uses. Why "practically" ideal? Because the industry has heard a lot of promotion and commotion about just one thing lately—and that's *weight*. But the importance of saving weight is relative; the ability to do the job comes first. Otherwise cars, and coins, could be made of wood or feathers or cork.

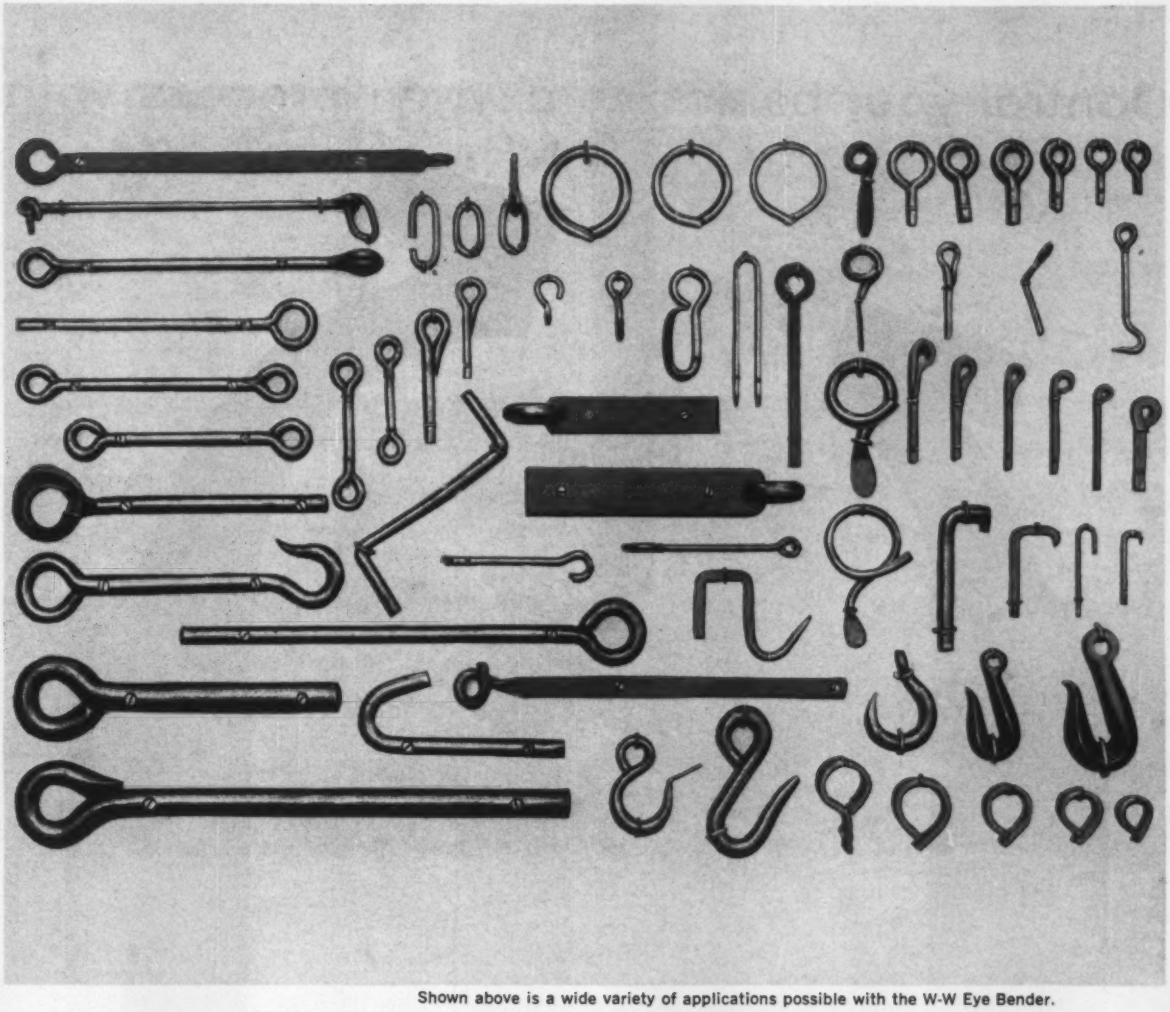
For example, why take a part made of a hard, dense material like cast iron—with its high tensile strength and ability to stand up to extremes of heat, vibration and friction without getting tired—and substitute another, more expensive material (with fewer of these characteristics) *simply because it is not as heavy?* Replacing the right material with a lighter one could affect production costs so that the pounds saved would be the most expensive pounds of all!

Since customers today are demanding *more* dependability and many manufacturers have *lengthened* warranty periods, is this the time to trade long life for high-priced lightness?

Leading engineers and designers, along with their colleagues in the iron foundry industry, believe that this is the time to use materials with the natural characteristics best suited to the job, and make *them* as light as possible through design and engineering. Together, they have already developed iron castings that reduce vehicle weight—economically.

HANNA
THE WORLD'S KNOWN NAME IN IRON

**THE HANNA FURNACE CORPORATION**
Suppliers of quality pig iron to the American foundry industry
Boston • Buffalo • Chicago • Detroit • New York • Philadelphia
Hanna Furnace is a division of
**NATIONAL STEEL CORPORATION**



Shown above is a wide variety of applications possible with the W-W Eye Bender.

# BENDING PROBLEMS? Investigate the Williams-White Hydraulic Eye Bender

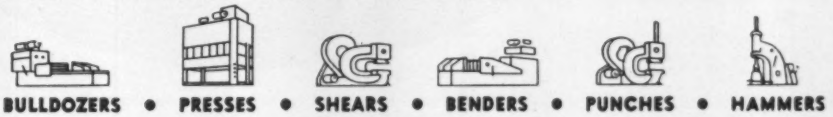
This fast, universal machine, expressly designed for economical bending of oval or round eyes, hooks or simple right angles, will handle stock to ¾" in diameter around a 1" mandrel or 1" diameter stock, hot, around a 1½" mandrel. Compact in size and economical to operate, this versatile machine is capable of producing 1,200 completed bends per hour. Photo shows its wide versatility.

Using interchangeable dies, a vast number of different bends can be made on the same machine. An inching arrangement allows fast die change to maintain peak production rates.

For additional information on how to achieve maximum production and economy on your bending operations, get your copy of Bulletin No. 71 or write, detailing your bending problems.

**WILLIAMS-WHITE & CO** 600 Third Avenue, Moline, Ill.

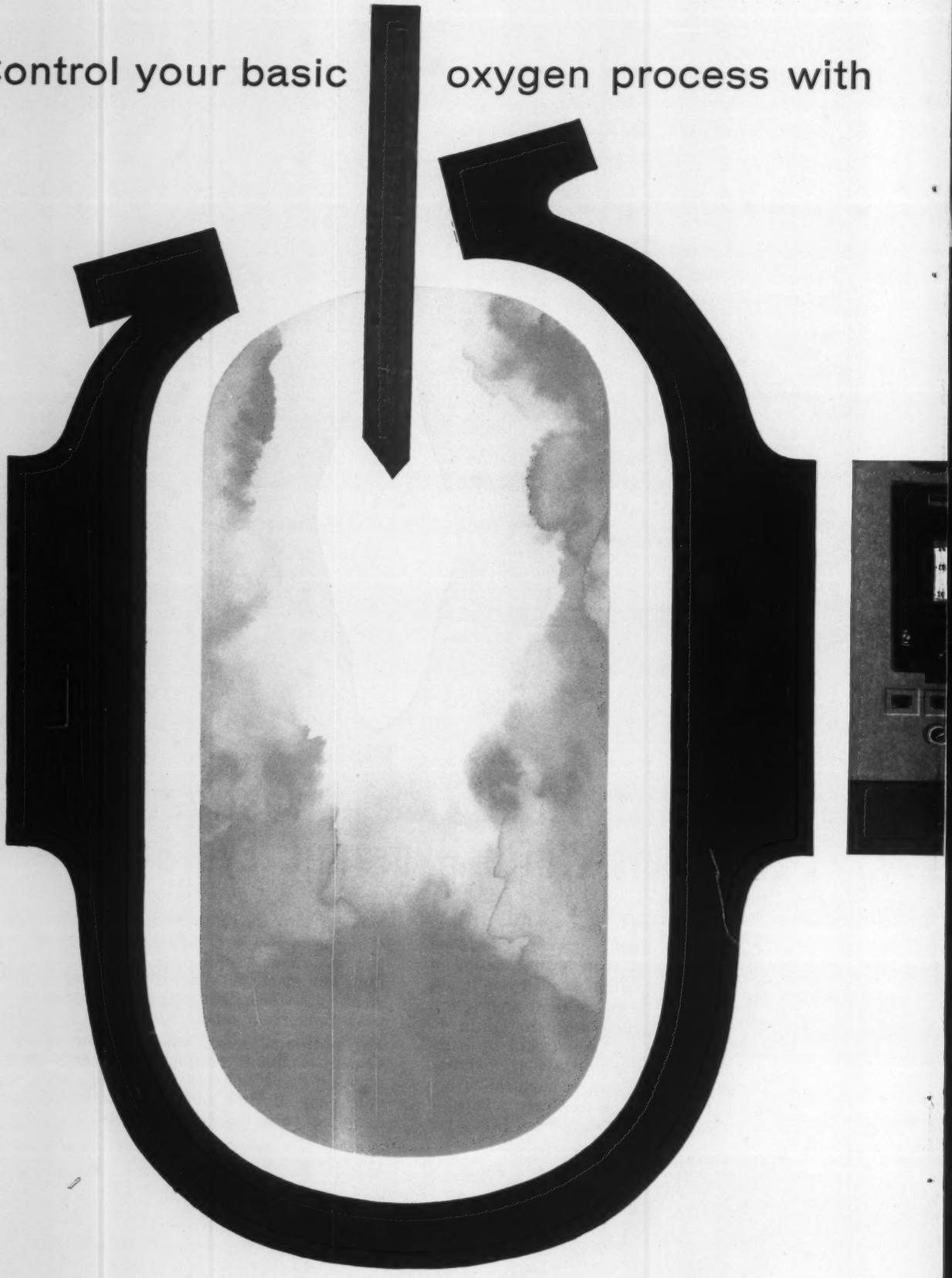
the measure of Performance Reliability for more than a century



**BULLDOZERS • PRESSES • SHEARS • BENDERS • PUNCHES • HAMMERS**

1M61

# Control your basic oxygen process with



# a Honeywell instrumentation system

The new basic oxygen process for steelmaking requires fast, precise, integrated control of all variables—oxygen pressure and flow in particular. Honeywell gives you a *complete system* of instrumentation—from primary elements to computer—tailored to the process and to the individual needs of your mill. This system brings extra advantages to the oxygen process.

Honeywell's application engineers will help you choose the proper components for your process from the broad line of Honeywell products—products proved throughout industry. Honeywell instruments, with electric or pneumatic control, are available for all parts of the oxygen process operation.

The Honeywell all-electric oxygen flow computer measures, records, and controls oxygen mass flow rate—automatically and continuously totalizing the oxygen used for all heats in all converters. The computer compensates automatically for temperature and pressure variations—and delivers the exact number of pounds of oxygen the charge requires.

The Honeywell instrumentation system holds temperature, pressure, humidity, and electrical power at optimum levels at every step of the process—protecting all the equipment—process vessel linings, exhaust gas hood, ducts, and precipitator.

Custom-designed Honeywell systems for the basic oxygen process are now performing in major steel mills across the country. The mills gain Honeywell's unique experience in controlling the oxygen process as well as the assurance of reliable, single-source responsibility for the entire system. Your nearby Honeywell field engineer can give you complete details. Call him today . . . he's as near as your phone.

MINNEAPOLIS-HONEYWELL, Wayne and Windrim Avenues, Philadelphia 44, Penna. In Canada, Honeywell Controls, Ltd., Toronto 17, Ont.

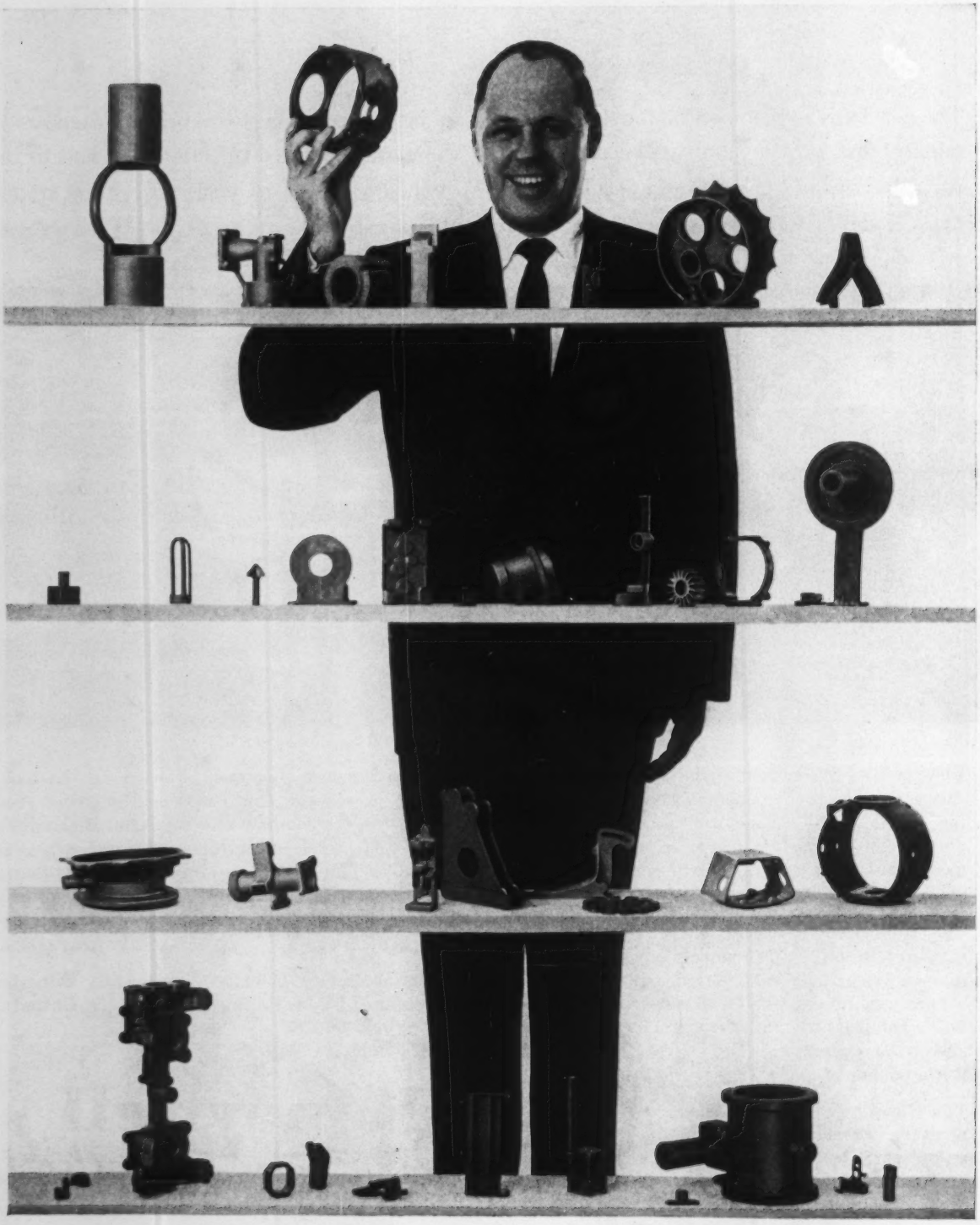
**Honeywell**

*First in Control*

SINCE 1885

## Because we've always

# WE'VE BECOME THE BIGGEST IN



## welcomed "little" jobs, too–

# THE INVESTMENT CASTING FIELD...

### ...and it makes good sense both for Arwood and its customers

No investment casting job has ever been or ever will be too small for us.

We don't have any "sidelines" nor is investment casting only a sideline with us. It is the "be-all and end-all" of our economic existence.

AS A RESULT: anybody–and we mean precisely that–*anybody* who suspects, thinks, feels or believes that an investment casting will help him solve a design or production problem gets the unqualified, undivided attention of the top talent we have to offer–from the trained field engineer in his territory, our design engineers, our estimating staff, our tooling men, and our production specialists. No one of these groups cares whether your order is for 50 parts or 100,000. If they accept the order, they want it handled to or above "specs"–preferably above.

Why? Simply because these men are dedicated to producing the finest that the investment casting process can deliver in any design, in any castable alloy (we cast any that can be), and in prototype quantities so small that it might surprise you.

This attitude of theirs is far from philanthropic. From an accountant's eye view, they realize full well that your "little ones" may soon grow up and become big ones.

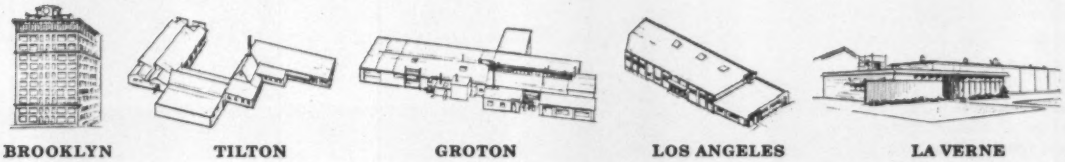
And when they do, Arwood is ready . . . more so than any other investment caster. In fact, we can take in stride all the volume that's required. Our five plants, extending from coast to coast, each with its own research, tooling, quality control and production facilities, can handle the biggest job you can offer.

In short, once the prototype or experimental phase is completed, Arwood can give you the quar tity production you need, *and* deliver it when you need it.

*What more can we say?* We can only sum it up by saying this – If you have a "difficult" part remember this: most "difficult" components, no matter what the alloy or quantity, might well be produced as an Arwood investment casting . . . and the cost is often extremely low, compared with conventional methods.

On the other hand, if we can't do it–and do it economically – we'll be the first to tell you so – immediately. We'd rather lose an order than a customer. As you can count on Arwood, you can count on that. Try us and see.

ARE YOU *REALLY* UP-TO-DATE ON WHAT INVESTMENT CASTING CAN DO? A lot of over-optimistic information has been disseminated in the past. Our 48-page "Practical Guide" gives forthright answers on what to expect, and, equally important, what *not* to expect. It tells how to save money by designing for the process, and also gives complete tables on the properties of castable alloys. It's yours for the asking.



BROOKLYN TILTON GROTON LOS ANGELES LA VERNE

**Machine the simple . . . cast the complex**

A complete service from design through tooling, production and finish machining. Seventy-one engineering representatives from coast to coast.

**arwood**

**ARWOOD CORPORATION** • 327A West 44th Street, New York 36, New York

PLANTS IN BROOKLYN, N. Y.; TILTON, N. H.; GROTON, CONN.; LOS ANGELES AND LA VERNE, CALIF.

# EUCLID

## MATERIAL HANDLING EQUIPMENT

*Since 1910*

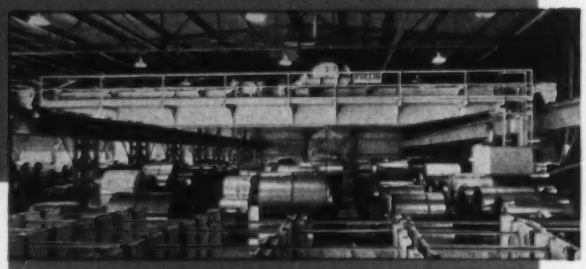
Euclid Cranes and Hoists are produced by specialists to render efficient service with minimum attention.

Their high quality is evidenced by a long list of discriminating purchasers and an impressive record of repeat orders.

Euclid Cranes are available in a large range of sizes and capacities. They include top running, underhung, single or double girder, motor driven or hand power, for all types of industry and service.

Trolleys are built with one or more hoists as required with any type of control. Top running, underhung, submerged or full revolving trolleys are available.

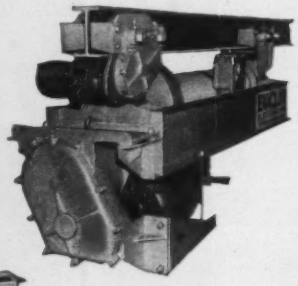
Special cranes are built to customers' specifications or to plans developed by our engineers.



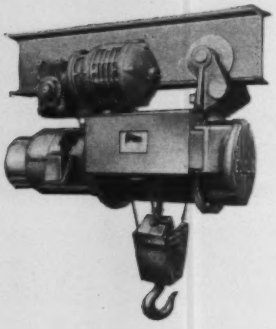
This double girder, cab-operated overhead traveling crane was built for Class 4 service.

It is one of seven Euclid cranes in operation in this warehouse.

Typical machine tool assembly cranes. Crane in foreground utilized for sub-assemblies. High capacity two hoist crane in background handles small assemblies as well as the completed machines.

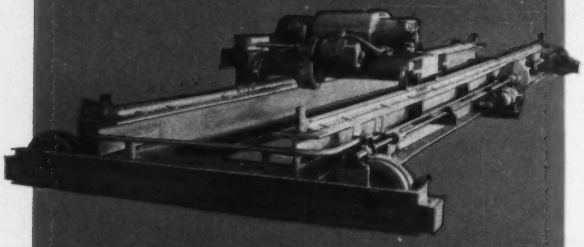


High lift heavy-duty monorail hoist, designed for either motor driven or hand power trolleys, may be provided with cab or floor control in capacities up to 30 tons.

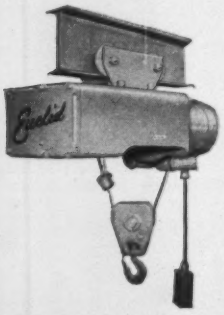


Series H hoists are available in 3 to 15 ton capacities in a variety of mountings to suit specific requirements.

Illustrated is a parallel mounted hoist with cone gear trolley drive.



Typical double girder general purpose crane composed of standard components. A wide variety of spans and capacities available with floor, cab or remote controls. Modified as desired to meet special requirements.




Euclid Series S Hoists feature quality at competitive prices. Work tested, time proved design. One piece combined gear housing and hoist frame of heavy steel. Easily serviced. Complete motor interchangeability. Capacities from ½ to 6 tons.

*Write for the Euclid Crane Catalog*

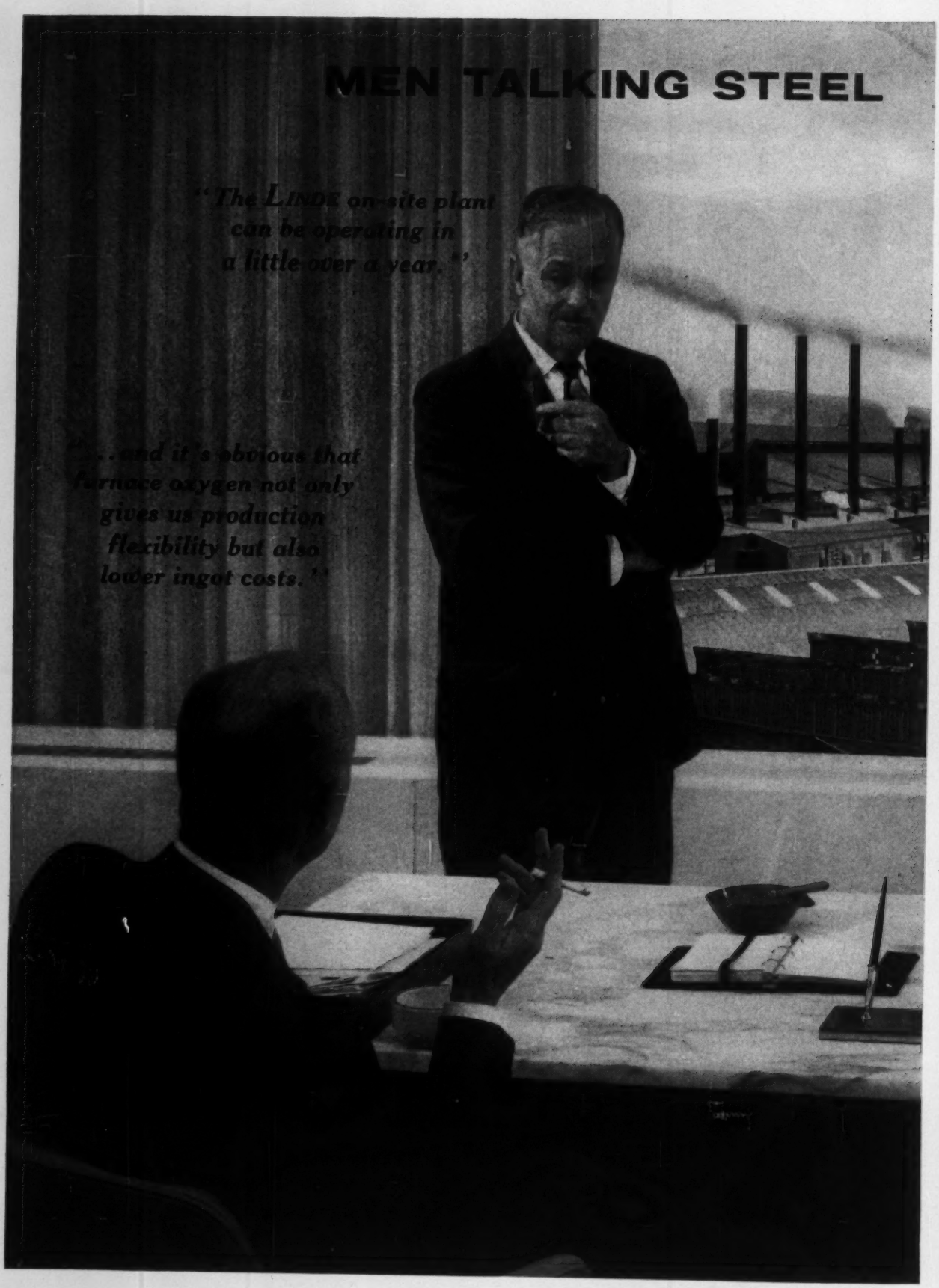
Ask for a Euclid Proposal stating the type and size of crane or hoist in which you may possibly be interested.

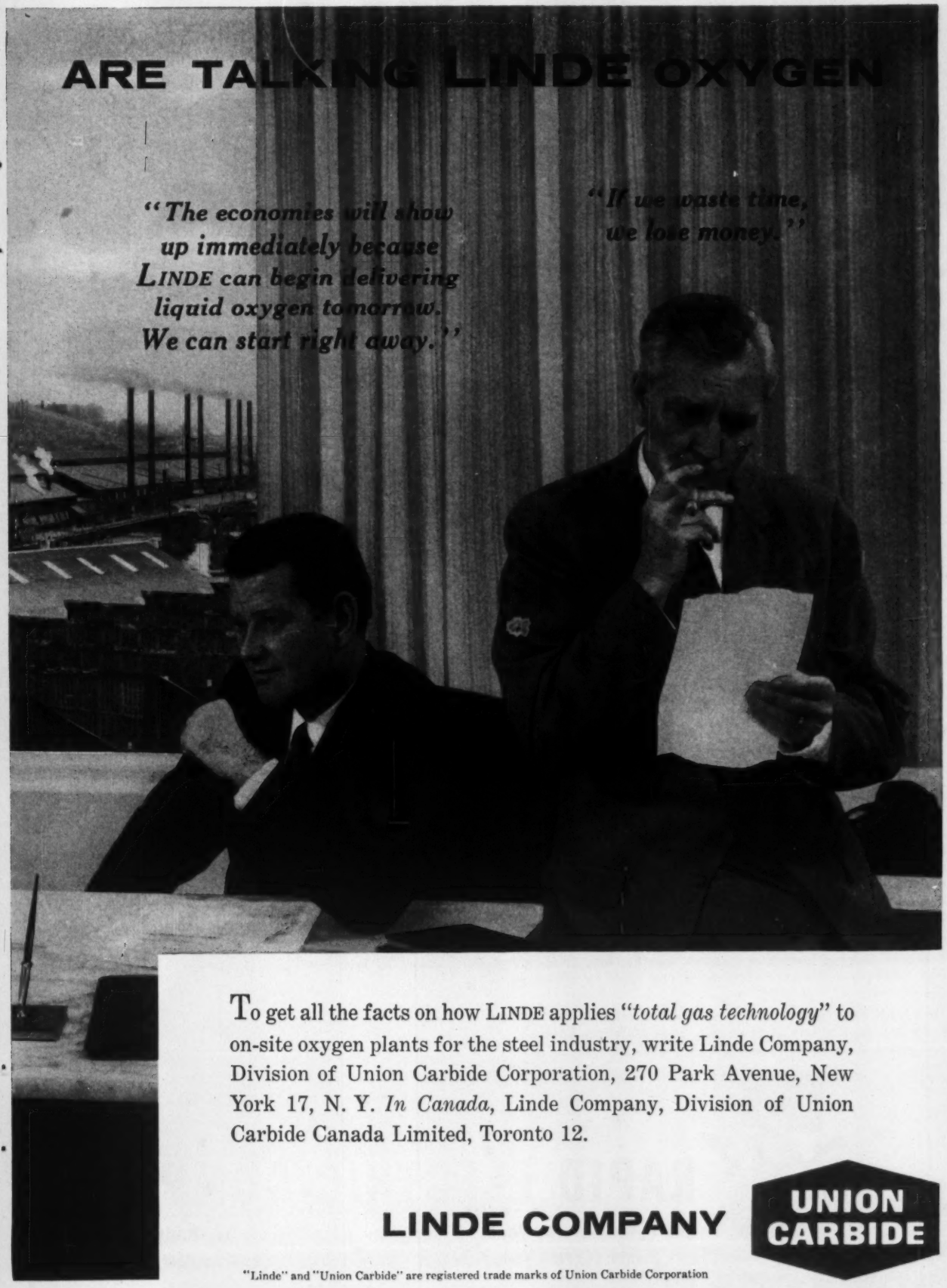
**The EUCLID CRANE & HOIST CO.** Chardon Road Cleveland 17, Ohio

# Federal
**BALL BEARINGS**

*One of America's largest ball bearing manufacturers*

**Quiet** We whirl Federal Ball Bearings at different speeds—and we **listen.** Seasoned Audio Inspectors and sensitive Anderometers police our production lines, on the alert to intercept anything but the quiet. They monitor our radial, angular contact and thrust bearings. Also, our self-aligning and shafted types. Single and double row, open and sealed. Result: bearings that purr on the job. Never a growl out of them. Just one reason why so much of industry turns on Federal Ball Bearings. Want more reasons? Send for our catalog. It describes hundreds of types in all sizes. The Federal Bearings Co., Inc., Poughkeepsie, New York.


MEN TALKING STEEL
"The LINDE on-site plant can be operating in a little over a year."
"...and it's obvious that furnace oxygen not only gives us production flexibility but also lower ingot costs."


ARE TALKING LINDE OXYGEN
"The economies will show up immediately because LINDE can begin delivering liquid oxygen tomorrow. We can start right away."
"If we waste time, we lose money."

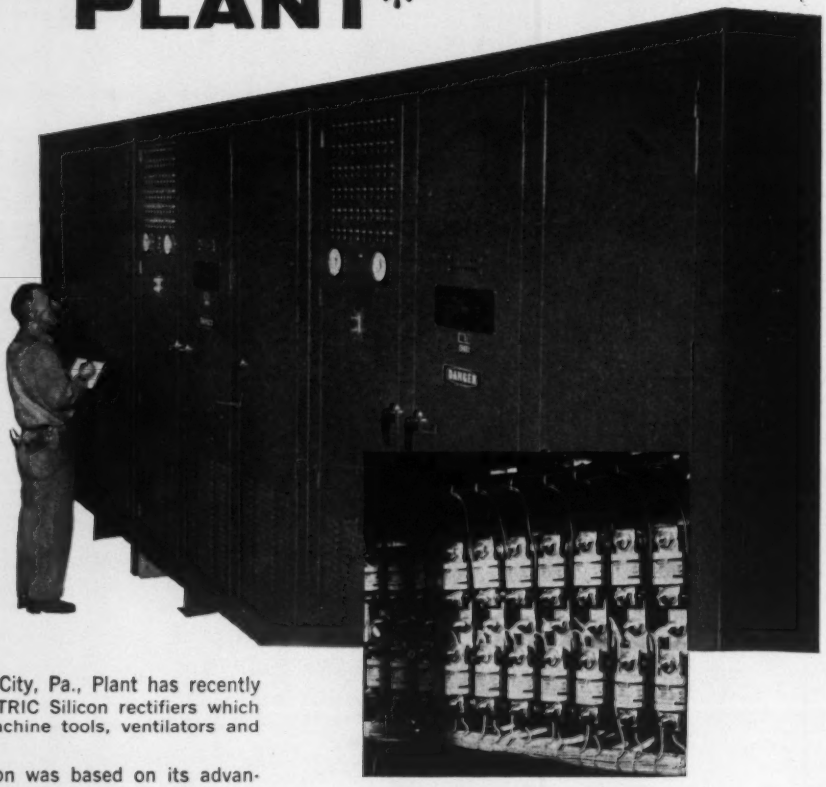
To get all the facts on how LINDE applies "*total gas technology*" to on-site oxygen plants for the steel industry, write Linde Company, Division of Union Carbide Corporation, 270 Park Avenue, New York 17, N. Y. *In Canada*, Linde Company, Division of Union Carbide Canada Limited, Toronto 12.

**LINDE COMPANY**

**UNION CARBIDE**

"Linde" and "Union Carbide" are registered trade marks of Union Carbide Corporation

# 1500 KW SILICON POWER INSTALLED at COOPER-BESSEMER PLANT*




The Cooper-Bessemer Corp.'s Grove City, Pa., Plant has recently installed three 500 KW RAPID ELECTRIC Silicon rectifiers which are now supplying heavy cranes, machine tools, ventilators and pumps with d-c power.

Cooper-Bessemer's selection of Silicon was based on its advantageous (inherent) high voltage characteristics and resulting high efficiency and power factor.

Specially designed protective systems, together with Silicon's natural longevity will insure continuous operation for many years (See insert).

For further information on this installation or other silicon installations and applications write or call, Shop Materials Company**, 733 Washington Road, Pittsburgh 28, Pennsylvania.

*Machinery Builders, (Engines and Compressors.)

**Representing RAPID ELECTRIC in the State of Pennsylvania.

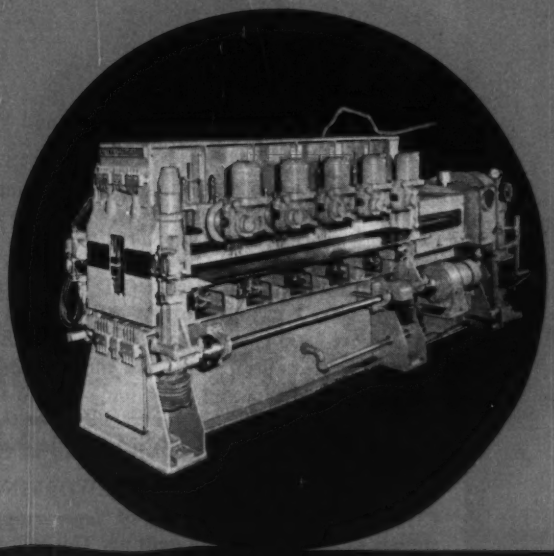
## RAPID ELECTRIC COMPANY

**2881 Middletown Road • New York 61, N. Y. • TAlmadge 8-2200**

**Plants: (4) New York, New York • Grays Bridge Road, Brookfield, Conn.**

# ROLLER LEVELERS

What kind of roller leveler do you need for your particular product? Want high speed? We have high speed levelers. Want an economical model for less demanding work? We have one of the best models in the business. Want a quick opening head? We have either hydraulic or motor-operated or hand-operated models. Want centralized lubrication? We equip all levelers with centralized lubrication with the exception of a few models. Want antifluting? We have it. Want individual adjustment or centralized adjustment? We have both types. Want more roll life per redressing? All of our rolls are induction hardened. Want an existing leveler reconditioned? We have an efficient service setup. What size leveler do you need — 1⅛" up to 18" diameter work rolls? We make all sizes and types. In fact, the Aetna-Standard Division of Blaw-Knox is one of the major manufacturers of Roller Levelers. For information, write to Sheet and Strip Sales, Aetna-Standard Division, Blaw-Knox Company, 300 Sixth Avenue, Pittsburgh, Pennsylvania.



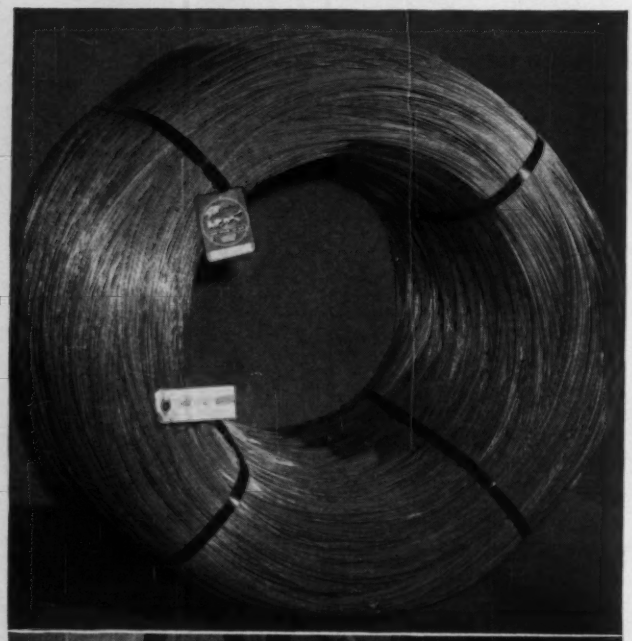
*This Roller Leveler has individual motor-operated backup roll adjustments. 1¾" dia. x 72" face . . . 21 rolls.*

BLAW-KNOX

Aetna-Standard Division

**BLAW-KNOX**

# DSC-PORTSMOUTH "LAYER WRAPPED" LPR® COILS GIVE UPHOLSTERY SPRING MAKER OVER 40 MILES OF NON-STOP FABRICATING PER SETUP



## LONG PRODUCTION RUN SNAG-PROOF COILS AVERAGE OVER 3200 LBS. .076″ HIGH CARBON WIRE

*Improved "Layer Wrapping" Method Steps Up Fabricating Efficiency*

**DSC-PORTSMOUTH DIVISION,** Rod and Wire Department, is in routine production and shipment of .076″ Upholstery Spring Wire in Long-Production-Run coils averaging over 3200 pounds in weight and over 40 miles in continuous length. One of these coils is shown in the adjacent photograph.

**LONG PRODUCTION RUN COILS** are not new. For years we have been regularly producing LPR's weighing up to about 4200 pounds. But it is something like crashing a "New Frontier" to produce spring wire LPR's as light as .076″ in gauge and weighing over 1½ tons—*and packaged in a way that virtually eliminates the chance of snagging or tangling in your pay-off operation.*

**THIS CONTRIBUTION** to **WIREWORKING EFFICIENCY** is one important result of *"layer wrapping" the strands as the big coils are built up.* This mill operation is shown in the lower photograph.

Would cost-reducing, Long-Production-Run, snag-proof coils fit into your brite wire fabricating picture? *For the complete story on LPR's and "layer wrapping", and answers to your questions regarding application, size-weight ranges and prices, call your DSC Customer "Rep" or write: Detroit Steel Corporation, Box 7508, Detroit 9, Michigan.*

*Customer Satisfaction—Our No. 1 Job*

**Customer "REP" Offices in Principal Cities**

DSC®

Steel — The Bargain Wonder Metal

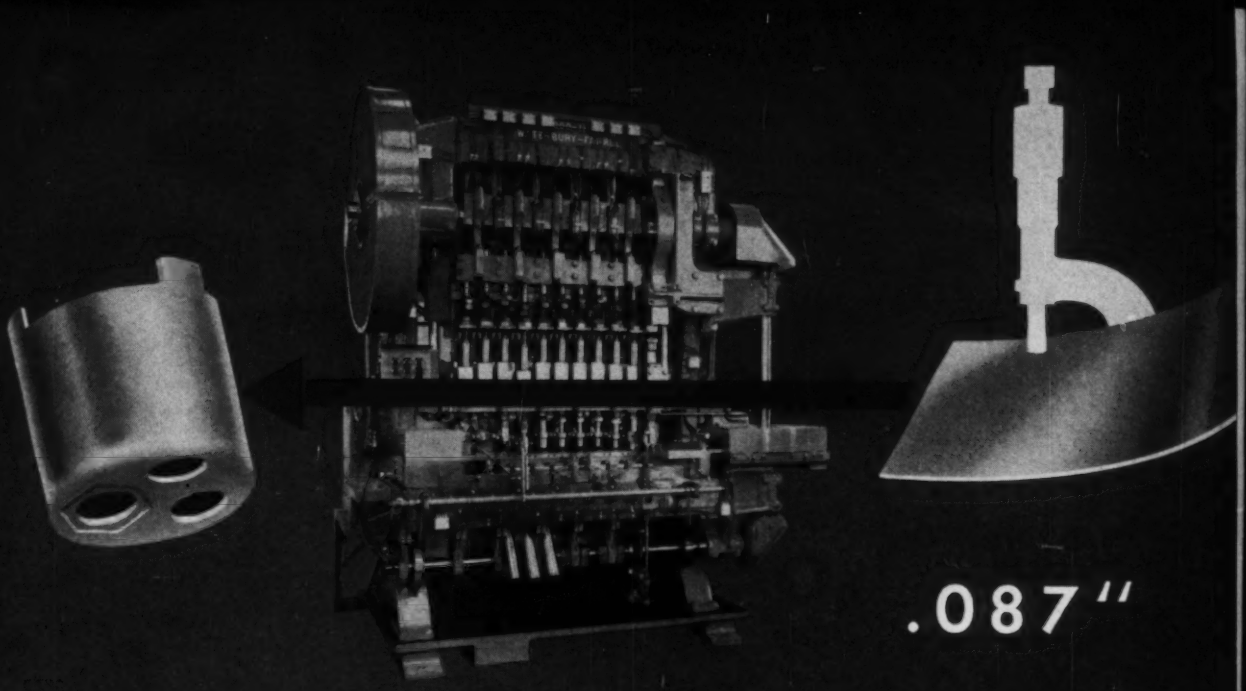
**Performance Proved**

# DETROIT STEEL

**Flat Rolled and Wire Products**

Detroit Steel Corporation—General Sales Office, Detroit 9, Michigan
Cable Address DETROSTEEL—New York

COPYRIGHT DETROIT STEEL CORPORATION 1961




# UP TO 70 FINISHED PARTS PER MIN.

## *From Heavy Gauge Strip On*
## WATERBURY FARREL CRANK EYELET MACHINES

Produce 50 to 70 complex, close tolerance parts per minute at low cost, from ferrous and non-ferrous strip up to .087" thick with Waterbury Farrel Crank Eyelet machines. In most cases, the parts are *finished* . . . no secondary operations required.

These rugged, multiple station machines are built in 4 sizes with from 7 to 11 operating stations. Blank diameters range up to $3\frac{3}{4}$" and the maximum shell length is $2\frac{3}{16}$".

These Crank Eyelet machines are part of Waterbury Farrel's wide range of both vertical and horizontal multiple station, transfer type machines which open the way to unprecedented economies in making parts from strip.

Investigate this modern cost-cutting production method by letting us analyze your drawings or samples.

WATERBURY FOUNDED 1851 FARREL

**THE WATERBURY FARREL FOUNDRY & MACHINE CO.**

**DIVISION OF TEXTRON INC.**

**Waterbury, Connecticut, U. S. A.**

**Sales Offices: Chicago • Cleveland • Los Angeles • Millburn, N. J.**

WF-79

# PQA

## proves it...

## breaking point tests show Allen screws are consistently better

***PRODUCT QUALITY ASSURANCE**

PQA is the symbol of unquestioned quality at Allen. It stands for constant quality control from rigid upgrading of incoming raw materials to final, *unconditionally guaranteed* shipment to you.

To give you some idea: Federal Spec. FF-S-86a calls for 4,950 lbs. for the ¼-20 cap screw. Day-in, day-out breaking point tests of these screws prove that Allens are *consistently* better . . . well above the minimum requirement!

Quality checks like this one confirm PQA every step of the way through Allen's manufacturing process. And to help you keep costs down and profit margins up, Allen manufactures 1457 standard sizes.

Remember . . . it costs you no more to have *genuine* Allens right from stock, and they are only a minor fraction of your assembly costs.

# ALLEN

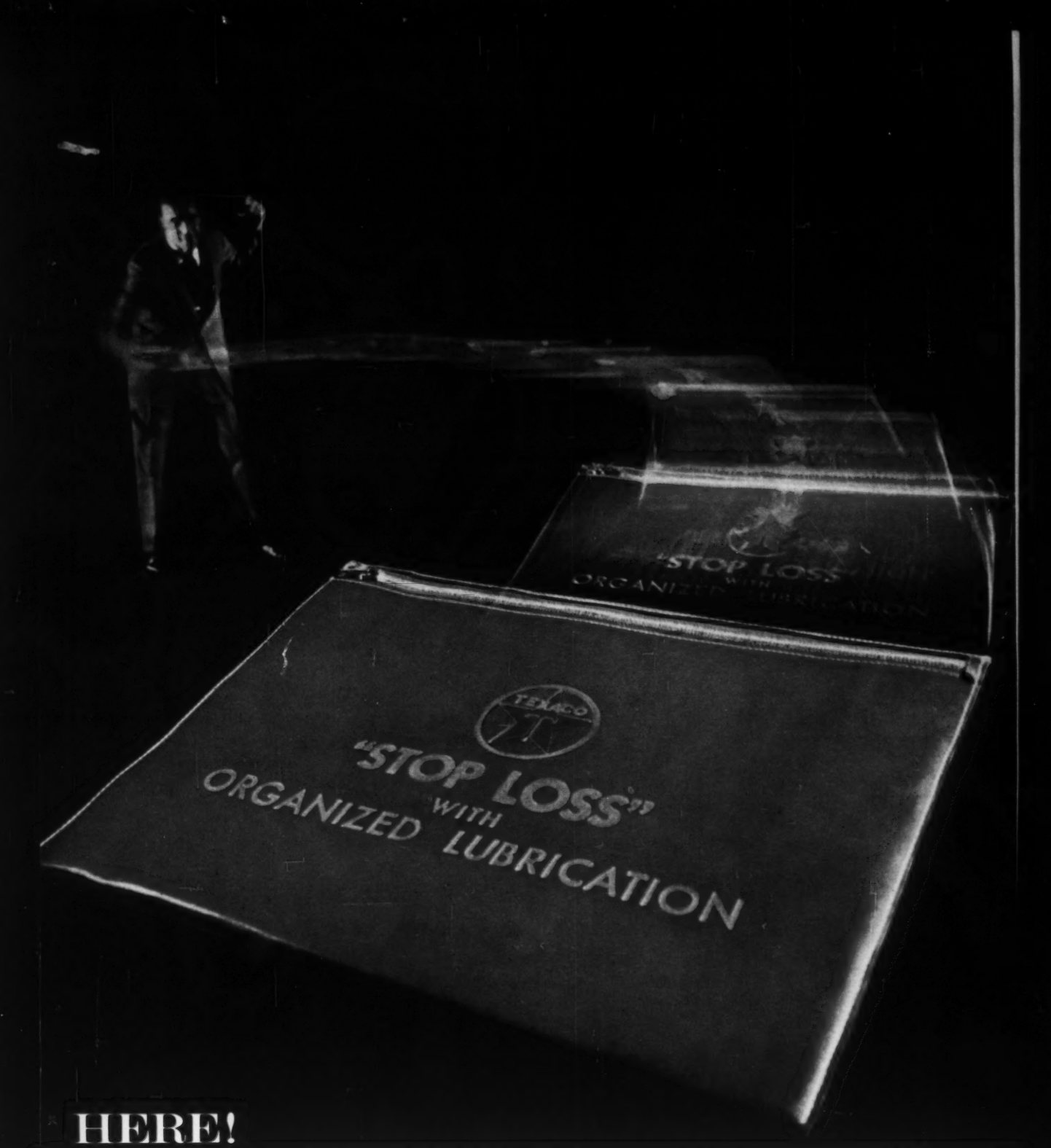
**MANUFACTURING COMPANY**

**HARTFORD 1, CONNECTICUT, U.S.A.**

Plants at Bloomfield, Connecticut • Warehouses in Chicago, Cleveland and Los Angeles

Genuine ALLEN products are available only through your ALLEN Distributor. He maintains complete stocks close by to help cut your freight costs, inventory, warehousing and handling. He offers fast, single-source service. He knows Allen products. And he makes Allen Engineering Service available to you any time. Call him!

ALLEN HEAD
HEX-SOCKET SCREWS




# HERE!

## ADD UP TO 4% TO YOUR NET PROFIT

Caught in a profit squeeze? The contents of the Texaco man's briefcase can help you do something about it. Inside is Texaco's "Stop Loss" Program. It's a new cost control tool that can knock as much as 15% off your maintenance costs by showing you how to organize your lubrication. You can tack this saving directly onto profit—for an average 4% net gain. It will pay you to get the details. Write for our folder "How to Starve a Scrap Pile." **TEXACO** INC., 135 East 42nd Street, New York 17, N. Y. Dept. IA-182

TEXACO

# V-R INSERTS...

## FIRST CHOICE of more and more plants

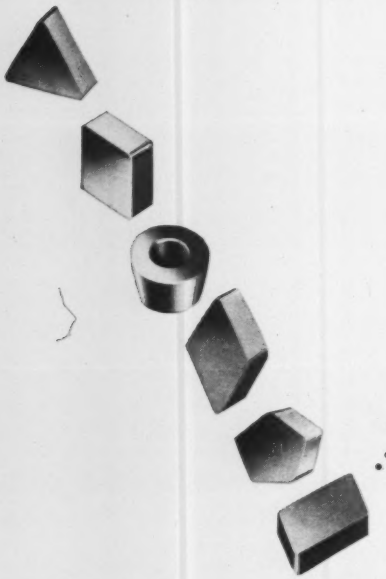
**PUREST RAW MATERIALS** enable V-R to produce the highest quality carbide grades.

**MOST MODERN METHODS,** such as vacuum sintering, make V-R grades better, more versatile.

**PRECISE PRODUCTION PROCESSES** assure accurate shapes, sizes, grades, dimensions and densities.

**CONSTANT QUALITY CONTROL** guarantees consistently superior performance from V-R inserts.

Contact your V-R representative or write us today for full information on the complete line of V-R Inserts, Toolholders and Face Mill Cutters.



...V-R INSERTS...BETTER FROM START TO FINISH...

CREATING THE METALS THAT SHAPE THE FUTURE

**VASCOLOY-RAMET**

862 MARKET STREET • WAUKEGAN, ILLINOIS

C-834

CONTINUOUS BAR MILL

*Designed and Built by*

# UNITED

1901 UE&FCO 1961

*Progress...Leadership*
*United for Sixty Years*

## UNITED ENGINEERING AND FOUNDRY COMPANY

**PITTSBURGH, PENNSYLVANIA**

*Plants at* Pittsburgh, Vandergrift, Youngstown, Canton, Wilmington

*Subsidiaries:* Adamson United Company, Akron, Ohio; Stedman Foundry and Machine Co., Inc., Aurora, Indiana

Designers and Builders of Ferrous and Nonferrous Rolling Mills, Mill Rolls, Auxiliary Mill and Processing Equipment, Presses, and other Heavy Machinery. Manufacturers of Iron, Nodular Iron and Steel Castings and Weldments.

# How many are "enough"?

A clean metal surface is an open invitation to *rust* or corrosion—easily the number one problem in metalworking. In 1869, *Cosmoline** was Houghton's single answer. Today, *Cosmoline* is still the answer. But Houghton now has many different *Cosmolines* and *Rust Vetos* to meet government and industry requirements: solvent-containing dry film, water displacing, non-solvents, fingerprint neutralizers and concentrates.

Since World War II, the trend in industry is toward lighter but stronger solvent-type coatings whose thicknesses are measured in thousandths of an inch. Among the dozens of Houghton solvent type preventives, the trend is also toward standardization on a minimum number of rust preventive compounds for general use. Leading in popularity are three *Rust Vetos* which can handle most industrial rust problems effectively.

### Rust Veto 377 (indoor)

This is far and away Houghton's most outstanding preventive for long term indoor storage of open or packaged machine parts and equipment! It also provides excellent protection on phosphatized and blackened surfaces. It is a solvent-type compound that deposits a transparent film. Rust Veto 377 protects metal surfaces for up to a year, yet can be easily removed with a mild solvent.

One of its most important built-in properties is polar activity. Rust Veto 377 actually pushes water aside, gets under it and clings to the metal. You can even apply it to dripping wet surfaces and get complete protection from rust.

Economy is another important feature. Because it leaves only a .0003" thick film, Rust Veto 377 provides efficient protection of a much greater area than is possible with the thick, greasy preservatives. Used on all types of ferrous or non-ferrous metals, it is non-gumming, non-staining, compatible with lubricants, and sprayable to −40°.

This combination of properties makes Rust Veto 377 the ideal, across-the-board, indoor rust preventive for such products as hardware, bearings, razor blades, dies, tools, gauges, and idle or stored machinery.

### Rust Veto 342 (outdoor)

For metals stored outdoors over long periods, new solvent type, Rust Veto 342 is an excellent general purpose preventive. When applied (dip, spray or brush) it forms a non-tacky, dry film that will not chip or crack. It protects metals from humidity, salt spray and weathering.

Two features make Rust Veto 342 unique among heavy duty rust preventives. (1) It provides heavy duty protection from rust for long periods, yet can be easily *removed* with only a solvent-soaked rag. (2) It deposits a *transparent* film. It will not obscure stamped numbers or coding on stored products and equipment.

### Rust Veto MP (Multi-purpose)

This is an economical and versatile concentrate which can be diluted with water, oil or solvents, or used neat. It is good for indoor and limited outdoor protection of metal surfaces. Not intended for the same jobs as either 377 or 342, MP has a definite place in the rust prevention picture.

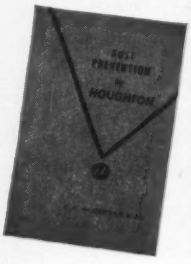
As the name indicates, it is a multiple purpose preventive concentrate. In undiluted form, MP is an oil type preservative that will protect metals during extended periods of indoor storage. Diluted with mineral oil it makes a slushing type rust preventive. Mixed with solvent it is a readily sprayable, water-displacing product. Diluted with water it is a fire-resistant, emulsion-type preventive. It is an effective fingerprint suppressor when diluted with a combination of water and solvent.

*A Field for Specialists.* No one, two or even twelve rust preventives can handle all rust problems. There is a definite need for thick, grease type preventives as well as special, spark plug varnish, aerosol sprays, wax coatings and others.

The trick is in having the parts properly cleaned (rust preventives will not work effectively on a dirty surface) and then selecting the fewest number of cleaners and rust preventives to do the most jobs, efficiently and economically. And only a specialist on both cleaning and rust prevention can help you arrive at the right answer. Why not ask your Houghton representative for a complete analysis of your requirements? Call him today or write E. F. Houghton & Co., 303 W. Lehigh Ave., Philadelphia 33, Pa.

New Rust Veto Spray has hundreds of uses in metalworking plants.

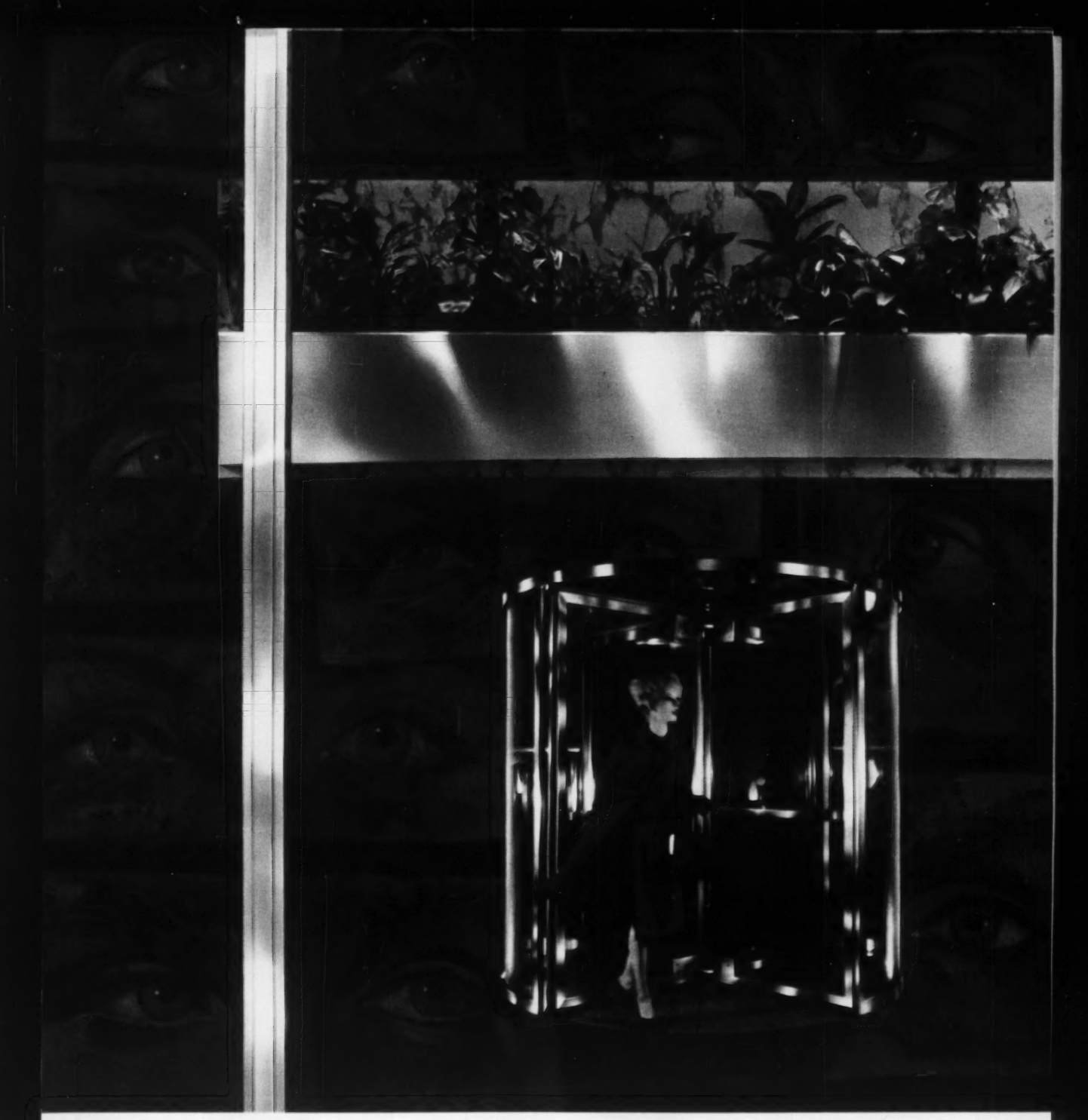
Brochure outlines major rust prevention problems and their solution. Write for your copy.




*Original Houghton TM, still used for Houghton government specification rust preventives.

# Houghton

INDUSTRY'S PARTNER IN PRODUCTION



# Duration of a first impression

Stainless steel has its own beauty secret. What meets the eye today will be unchanged 20 or 30 years from now, the finish still flawless, unmarked by wear or corrosive air. Unlike some architectural metals with beauty that is only skin deep, stainless will last indefinitely—with little or no maintenance.

Time-tested, consistent product performance like this comes from consistent quality materials—and J&L leads the stainless steel industry in melt shop standards, the point where quality starts. That is why J & L stainless, in a variety of finishes, is widely used in all types of buildings, inside and outside, wherever a first impression—and a lasting impression—is important.

Your J & L distributor can provide the technical assistance and the consistent quality stainless steel you need, backed by the consulting services of J & L's architectural department.

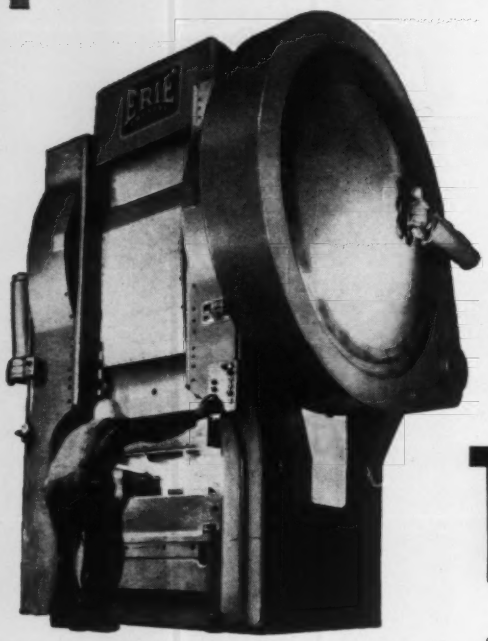
**Jones & Laughlin Steel Corporation**

STAINLESS and STRIP DIVISION · BOX 4606 · DETROIT 34 · MICHIGAN

STAINLESS
SHEET · STRIP · BAR · WIRE

WANT TO AUTOMATE YOUR FORGING OPERATION?

# You set your production goal...




# ERIE WILL BUILD THE PRESS

Set your sights on higher output . . . Erie Foundry makes it possible to achieve it, with a high-volume automated forging press. As the first company to automate forging, Erie specializes in custom-designing and building automated presses in capacities up to 8,000 tons.

A single Erie-built automated press, with only one operator-observer, can actually triple your present production rate equalling the output of three regular forging presses and nine production men!

Trimming, too, can be accomplished in a single production cycle. With billet supply and finished part removal conveyorized you can achieve a production volume of, say, 1200 track-link forgings per hour.

To meet your specific needs, Erie Foundry will design a machine for high volume production of such parts as connecting rods, gear blanks, automotive and tractor valves, pinions, track links and wheel hubs.

For the complete story, phone or write Mr. R. E. Sanford, Erie Foundry Company, Erie 1, Pa.

ERIE

**ERIE FOUNDRY COMPANY** SINCE 1895

ONE OF THE GREAT NAMES IN FORGING

Manufacturers of Forging Hammers • Forging Presses • Hydraulic Presses • Trimming Presses

EF-60-03

J-8082

# No place for guessing games!

The right choice of materials is certain when you bring your bearing problems to Bound Brook. Choosing from over 25 grades of sintered iron and bronze, our powder metallurgy engineers select the material with exactly the right properties for *your* application . . . the right balance of hardness, strength, ductility, density and thermal conductivity to fit your needs. They can create many special properties for you, too, by varying the composition of the metal powders. Your choice is always right when you choose Bound Brook for your bearings.

**BOUND BROOK BEARING**
**CORPORATION OF AMERICA**
A BIRFIELD COMPANY
*Pioneer in Powder Metallurgy Bearings and Parts • Plants at Bound Brook, N.J. and Sturgis, Mich*

# WE MAKE SPECIAL STEELS—ESPECIALLY WELL

HIGH SPEED STEELS
TOOL STEELS
STAINLESS STEELS
ALLOY STEELS
FORGED ROLLS
EXTRUSION PRESS PARTS

# MARATHON

## SPECIALTY STEELS, INCORPORATED

A Division of Deutsche Edelstahlwerke A. G., Krefeld, West Germany DEW 375 Park Avenue, New York 22, N. Y.

## Metalworking Newsfront 6

CONTINUOUS CASTING is attracting a new interest among major steel producers. One of the largest has installed a pilot plant. Others are studying the process. Revived interest is tied to performance of casting units abroad and to the rise of basic oxygen processes. Oxygen vessels meet the need of continuous casting for small batches of steel at short intervals.

DEMAND FOR PRE-ENAMELED ALUMINUM SHEET will spiral to more than 150,000 tons annually by 1965. This is the forecast of W. T. Ingram, general sales manager, Reynolds Metals Co. He points out that since the company opened the industry's first wide sheet paint plant in 1959, pre-enameled sheet use has jumped from a few million pounds to a present level of over 60,000 tons.

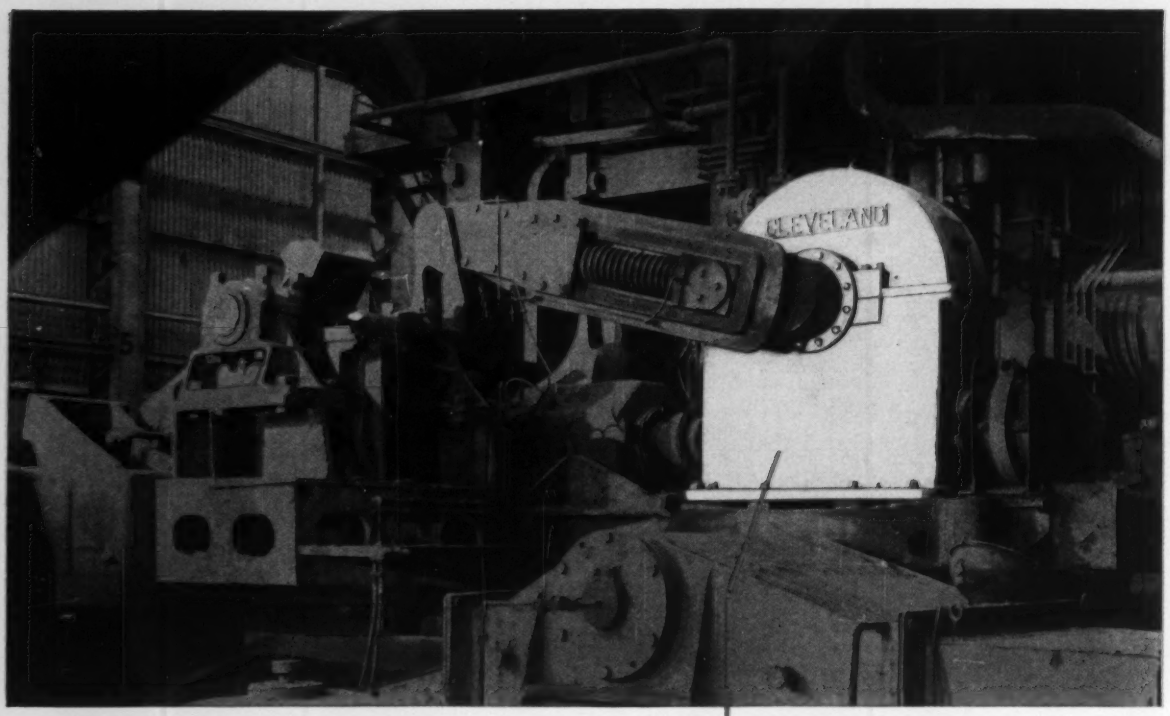
MANUFACTURERS OF PAPER MAKING EQUIPMENT are finding a ready market in India, reports the Commerce Dept. The nation is pushing it's development of the pulp, paper, chipboard and board industry.

ALLOY STRUCTURAL SHAPES are taking on a new look at U.S. Steel Corp. The company is working to develop means of quenching and tempering these structurals. The project is part of a trend to extend the range of quenched and tempered mill products. Thin gage sheets were recently added to the group. And new types of high strength tubing are being studied by producers.

GALVANIZED SHEET SHIPMENTS to the auto industry reached an all-time high of 218,960 tons in 1960. Shipments in 1959 were 158,280 tons. The swing to unitized auto bodies "promises a great new market" for galvanized, says the American Zinc Institute.

MOBILE HOMES and travel trailers continue to offer a solid market for metals and metal products. In 1960, 142,000 units were sold. In record year 1959, mobile homes used 23,000 tons of steel sheets, 135 million lb of structural steel. Forecast for aluminum sheet usage this year: 40 million lb.

INCREASED USE OF ALUMINUM IN RESIDENCE BUILDING is getting a boost from Reynolds Metals Co. The company this month broke ground for another of its urban renewal projects, a 98-unit development in Richmond, Va. Nearly 7000 home units are in the works or on the boards of the company. Aluminum products used in the houses range from fencing to lighting fixtures.

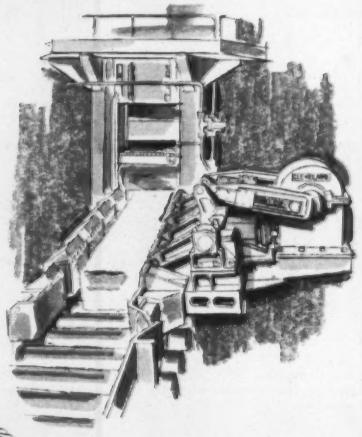



# Two Cleveland Speed Reducers drive "Magic Fingers" on Kaiser Steel's New Slabbing Mill

Here's one of two rugged 3000-AT Cleveland Worm Gear Speed Reducers busy at work driving the manipulator finger lift mechanism on Kaiser Steel Company's new 45 x 90-inch Universal Slabbing Mill at Fontana, California. With these Cleveland Reducers, mounted on the slab pusher, turning massive slabs between mill passes is a simple, rapid operation.

In these large, yet compact, space-saving Clevelands, worm and gear shaft bearings are supported by a massive internal structural framework that enables the units to withstand extreme shock loads. Their right angle shaft arrangement provides a distinct advantage over other forms of gearing that might not fit the space limitations of a specific installation.

In all types of industrial plants, wherever rugged, compact and dependable speed reducers are needed, Clevelands handle the toughest assignments. Call your Cleveland Representative today, or write for Bulletins 145 and 410-A to get complete information on how to handle your most demanding power transmission jobs.



**Cleveland Worm & Gear Division**
Eaton Manufacturing Company
3282 East 80th Street • Cleveland 4, Ohio

**CLEVELAND**
Worm Gear
*Speed Reducers*

# Builders Used Most Steel in '60, One-Fourth of All Shipments

**Special IRON AGE analysis shows construction took 18.2 million tons of all steel shipped last year.**

**Study, which redistributes warehouse tonnage, makes automotive second largest user.**

■ The construction industry increased its margin as the nation's leading steel user in 1960.

As in 1959, the builders paced steel consumers in a special IRON AGE analysis of American Iron and Steel Institute reports of finished steel shipments.

In 1960, construction and contractors' products took 26.6 pct of all steel shipments, including steel received from service centers. The year before, the industry took 25.1 pct. (See table, P. 68.)

**Direct and Indirect**—While the builders accepted 19.3 pct of direct mill shipments, the industry's share of the total was much higher since it relies on warehouses for such construction products as pipe, reinforcing bars, and galvanized sheet.

The auto industry was the second largest steel user in 1960, taking 21.3 pct of direct mill shipments and 23.4 pct of total shipments. In 1959, the automakers had 22.5 pct of total shipments.

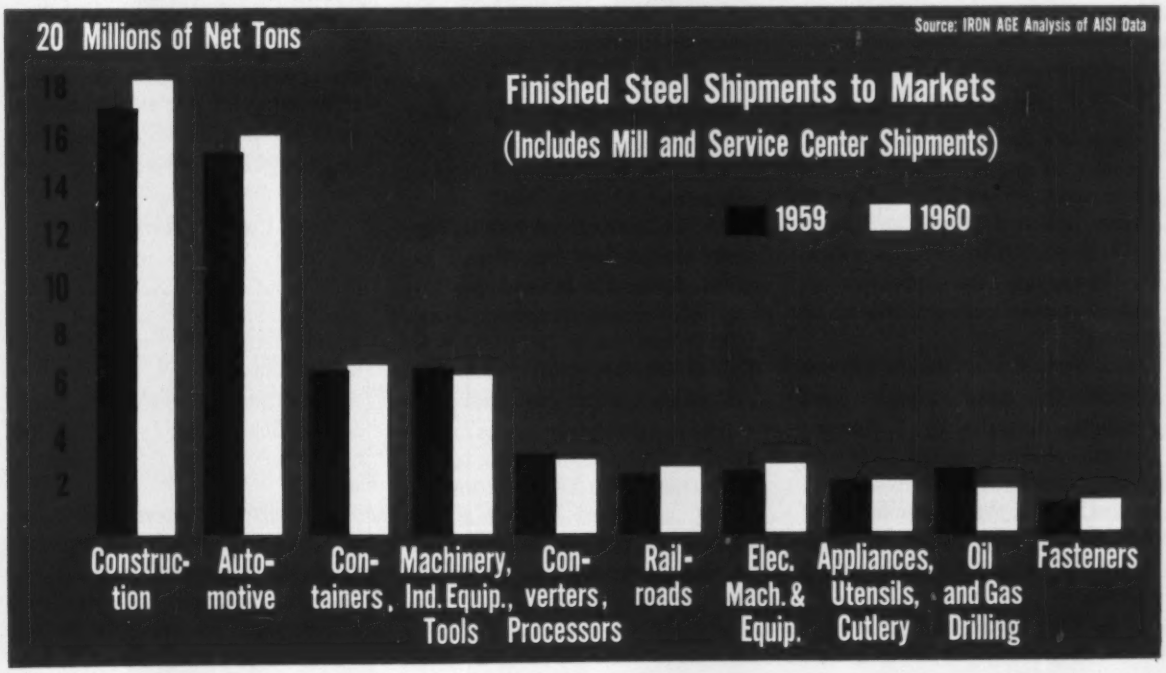
A vital part of The IRON AGE analysis is redistribution of service center tonnage—more than 18 pct of all mill shipments—among actual steel consuming industries.

**Warehouse Tonnage Divided**—This division of distributor tonnages revises the final position of major steel consumers. With it, the five top steel buyers are construction, automotive, containers, machinery, industrial equipment and tools, and converters and processors.

If only direct mill shipments are counted the five leaders are automotive, construction, warehouses and distributors, containers, machinery, industrial equipment and tools.

The special study was completed

## How Steel Use Varied—1960 vs. 1959



# Steel Distribution by Consuming Industries

| | Total Shipments from Mills and Service Centers | | Direct Mill Shipments Only | |
|---|---|---|---|---|
| | Net Tons | Pct | Net Tons | Pct |
| Construction, (includes maintenance, and contractors' products) | 18,243,646 | 26.6 | 13,265,531 | 19.3 |
| Automotive | 16,058,062 | 23.4 | 14,610,424 | 21.3 |
| Containers | 6,755,048 | 9.9 | 6,428,966 | 9.4 |
| Machinery, Industrial Equipment and Tools | 6,266,952 | 9.1 | 3,957,935 | 5.8 |
| Converters and Processors | 3,066,953 | 4.5 | 2,928,226 | 4.3 |
| Rail Transportation | 2,651,280 | 3.9 | 2,525,267 | 3.7 |
| Electrical Machinery and Equipment | 2,614,365 | 3.8 | 2,078,305 | 3.0 |
| Other Domestic and Commercial Equipment | 2,148,112 | 3.1 | 1,958,695 | 2.9 |
| Non-Classified Shipments | 2,127,826 | 3.1 | 2,120,378 | 3.1 |
| Appliances, Utensils, and Cutlery | 2,034,140 | 3.0 | 1,759,665 | 2.5 |
| Oil and Gas Drilling | 1,614,666 | 2.4 | 404,224 | 0.6 |
| Bolts, Nuts, Rivets, and Screws | 1,229,278 | 1.8 | 1,071,723 | 1.6 |
| Agricultural | 1,149,778 | 1.7 | 1,003,485 | 1.5 |
| Forgings (other than automotive) | 1,050,058 | 1.5 | 841,223 | 1.2 |
| Shipbuilding and Marine Equipment | 744,617 | 1.1 | 622,190 | 0.9 |
| Mining, Quarrying and Lumbering | 300,940 | 0.4 | 288,062 | 0.4 |
| Aircraft | 291,192 | 0.4 | 77,488 | 0.1 |
| Ordnance and Other Military | 188,487 | 0.3 | 164,783 | 0.2 |
| Warehouses and Distributors | — | — | 12,479,830 | 18.2 |
| Total Domestic | 68,535,400 | 100.0 | 68,586,400 | 100.0 |
| Export | 2,613,818 | — | 2,562,818 | — |
| Total Shipments | 71,149,218 | — | 71,149,218 | — |

IRON AGE distribution of data supplied by American Iron and Steel Institute.

for The IRON AGE by Herman B. Director Associates, Inc., Washington, D. C., specialists in commercial research, market and product development in industrial materials.

**How It's Done**—In the case of stainless steel shipments, a joint study made by steel producers and service centers for the first half of 1956 is used. This provides a base for identifying the industries to which service centers ship their stainless.

However, similar studies are not available for carbon and alloy steel products. But the U. S. Census Bureau published, in the 1954 and 1958 Census of Manufactures, summaries of steel consumed for each industry with a four digit SIC (Standard Industrial Classification) number.

This data, when compared with mill shipment reports, gives a base for determining the amount of steel received directly from mills, plus that from service centers or consumer inventories.

**Why It's Important**—By distributing warehouse tonnage it's easier to trace clearly actual increases or decreases in steel use by individual industries.

For example, if only mill shipments are counted the oil and gas industry's decline in steel use was relatively small. Shipments were 540,000 net tons in 1959 and 404,000 net tons last year.

However, when both mill and warehouse shipments to the industry are combined, the decrease is much greater. In 1960, oil and gas drilling accounted for 1.6 million net tons, compared with 2.6 million net tons the year before, a full million tons less.

Another heavy loser in 1960 was the machinery industry which dropped from 9.7 pct of all shipments to 9.1 pct.

**Other Large Users**—Other important users of steel last year were containers, 9.9 pct of shipments; converters, 4.5 pct; rail transportation, 3.9 pct; electrical machinery and equipment, 3.8 pct; and appliances, 3 pct.

**Stock Cutback Hurt**—Total steel shipments in 1960 increased very little from 1959 levels. In 1960, domestic markets received 68.5 million tons, contrasted with 67.9 million tons in 1959.

Reductions in inventories, beginning in the second quarter of '60, helped slow down the demand for steel.

But analysis shows that inventory levels, steel use, and steel production lead times intersected sometime in January. As a result, steel output began increasing in the following month.

# Tax Reform Due for Rough Ride

## Tax Credit for Capital Spending Is Big Issue

**President's tax plan is sure to be changed in Congressional mill. As it stands, business will gain tax credits on capital spending.**

**But dividends will be taxed at higher rate. And capital gains will be hit harder.**
**By R. W. Crosby**

■ President Kennedy's controversial tax program — including the $1.7 billion investment credit plan —goes before Congressional study next week. Word from Congressional sources is that the program is sure to be changed.

Democrats as well as Republicans found the program a little hard to swallow whole.

The major controversy is expected to rage over the incentive for businessmen investing in modernization and expansion of private plant and equipment. Generally, this plan would give tax reductions up to 30 pct of a company's or businessman's taxes for one year.

**Objections** — Republican members of the House Ways and Means Committee, which began hearings on the tax plan Wednesday, call it a "declaration of war on American free enterprise." Some Democrats prefer direct depreciation write-offs to investment credits; others say it takes away more than it gives or that it favors the big businessman over the small.

In last week's tax message there is no dearth of reforms. Besides the tax incentive for business investment, President Kennedy proposed:

Higher taxes on dividends and interest.

Taxes on some profits from sales of depreciable business property but at ordinary rates instead of the lower capital gains rate.

Continuation of the present 52 pct corporation tax rate and present excise taxes.

A crackdown on businessmen's expense account deductions.

Gradual repeal of deferral of taxes on corporate income earned abroad and left abroad.

**Loss Recoup**—With these measures the President hopes to recoup the $1.7 billion a year revenue loss created by his investment incentive plan. This incentive plan, too, he expects will create 500,000 jobs.

Under the proposed tax credit plan, tax credits would be taken as an offset against a company's tax liability, with a 30 pct limit on the reduction each year. It would be available to individually-owned businesses as well as corporations.

The credit would be retroactive to "eligible investment expenditures" made after January 1, 1961.

But not all investments are "eligible."

The President would limit expenditures to money spent on new plant and equipment, on assets located in the U. S., and on assets with a life of six years or more. Investments by public utilities other than transportation would be excluded, as would be investment in residential construction including apartments and hotels.

**Scales Balanced** — Whereas the tax credit plan is designed as an incentive to business and industry, other parts of the reform program balance the scales.

A cut in the corporation income tax, dear to industry's heart, is still in limbo. President Kennedy requests it be extended past the expiration date of June 30.

The President says deferral of taxes on corporate profits earned and left abroad is no longer justified for Europe and Japan, whose post-war economic rebuilding has been completed. For these areas and Canada, he says, deferral should be ended in equal steps over a two-year period starting in

## What President Asks—and Why

**President asks for this investment tax incentive plan:**

**1. Write off of 15 pct** of all new plant and equipment investment expenditures in excess of current depreciation allowances;

**2. 6 pct of such expenditures** below this level but in excess of 50 pct of depreciation allowances; with

**3. 10 pct of the first $5000** of new investment as minimum credit.

**He claims his plan is superior for these reasons:**

**1. Adoption of the incentive credit would not foreclose later action** on depreciation. And depreciation reform may be part of the overall tax reform coming next year.

**2. The proposed credit would not be recorded** in a company's accounts as depreciation would be. Therefore, it would not raise current costs and act as a deterrent to price reductions.

**3. A speedup in depreciation only postpones** the timing of the tax liability on profits from the investment to a later date.

1962. Tax deferral would continue on earnings left in less developed countries.

**Capital Gains Hit**—The President recommends that capital gains treatment be withdrawn from profits on disposition of both personal and real depreciable property. The withdrawal of the preferential treatment would be to the extent that depreciation has been deducted for the property by the seller in previous years. This would permit only the excess of sales price over the original cost to be treated as capital gains. The remainder of the profits would be treated as ordinary income.

The President's plan to change dividend and interest taxes is a shocker. He calls for a 20 pct withholding rate on dividends and interest. Along with this he would repeal the exclusion from taxation of the first $50 of dividends received by a taxpayer, and of the 4 pct credit on dividends above $50. He says they cost the government $450 million a year.

**Travel Expenses**—The attack on expense accounts is directed at deductions taken for excessive personal living expenses incurred in business travel away from home.

He would like Congress to set a daily limit on out-of-town expenses, perhaps about $25.

To top it all off, the President requests more funds to hire more U. S. Treasury agents to check tax returns. And he says there will be a "maximum effort" made to crack down on tax evasion.

## No "Gifts" For Pentagon People

**Businessmen friendly with U. S. Defense Dept. personnel could get in trouble offering them "gifts, favors or hospitality."**

Defense Secretary Robert S. McNamara has issued a code of conduct for Pentagon personnel. It instructs them to report to the Justice Dept. any offer that might be considered an attempted bribe.

# Commodity Pricing Rapped by Alcoa

**Alcoa last week lined up with its steelmaking critics. It is unhappy with aluminum industry pricing tactics.**

**The company is working to develop stainless clad aluminum.**

■ A major aluminum producer lined up with steel on two counts last week.

At its annual meeting, Aluminum Co. of America revealed: 1—It is unhappy with some pricing practices of the aluminum industry; and, 2—It is working to develop a stainless cladding for aluminum.

Pricing was discussed by F. L. Magee, Alcoa board chairman.

"Just to go out and buy a market with a lower price that can't be maintained is foolishness," he said.

**Mills Charge**—Steel mills have often charged the aluminum industry with this kind of competition. Mr. Magee indicated his own disapproval of any price that was strictly promotional and would ultimately have to be increased. He cited the figure of 28¢ a pound for oil can stock as an example of extreme pricing.

"I think aluminum can be sold on its merits, even in development stages, at a reasonable profit."

**Looking Ahead**—However, Mr. Magee also made clear his feeling that a producer could properly anticipate increased volume in setting prices during a period of market development.

Alcoa's basic philosophy has always been one of fair and stable pricing, he said. He said the company has lost orders trying to maintain this policy; that it has been forced to follow in some unsound moves.

From a profit standpoint, said Mr. Magee, he would settle for price stability if this could be achieved at the present official levels. He implied there was a sizeable gap between published lists and actual prices charged.

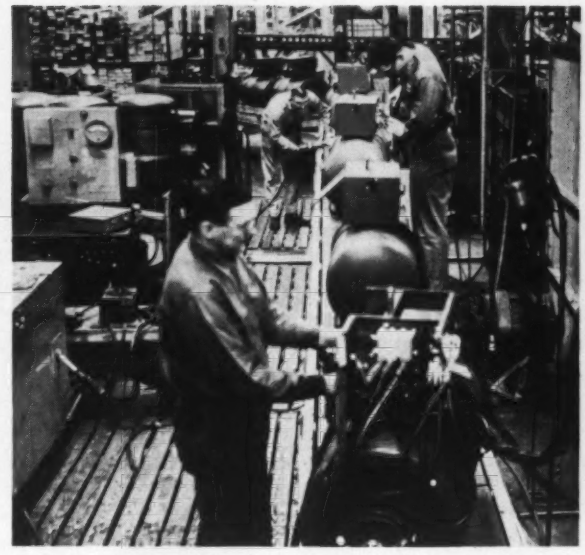
**Surprise Move**—The mention of a stainless clad aluminum by Alcoa came as a surprise. Fairmont Aluminum Co. recently announced it was joining stainless and aluminum sheet with a molecular bond. The new product is being offered commercially by Fairmont. Other suppliers are said to be working along similar lines.

However, it was believed these efforts were directed mainly at the cooking utensil field. Last week, Alcoa displayed a sample of an automotive grille, made of aluminum with stainless cladding.

**Research Stage**—A company official says cooking utensils are still regarded as a major application for the material. The project is still in the research stage.

But he says Alcoa is building a pilot facility to make the clad sheet.

**MAGEE:** Sold on its merits.



**EFFICIENCY:** Welders come down the line at Lincoln Electric Co., traditional price leaders in the industry.

Efficient production of quality equipment enables U. S. manufacturers to stave off foreign producers.

# Price Edge Favors U.S. Welders

**Welding equipment manufacturers have managed to reverse the usual trend of being undersold by foreign producers.**

**They not only hold a price advantage in the U. S., but export 10-20 pct of their output. By T. M. Rohan**

■ Foreign welding machines are still a rarity in the U. S.

Domestic producers not only have staved off foreign sales invasions. They are now exporting 10 to 20 pct of their total output.

German, Dutch, and Japanese builders have all tried to capture shares of the $1 billion-a-year U. S. welding machine market. But cost has stymied them. Most standard U. S. arc welding units cost less than they did in 1934, even though basic materials like steel and copper have jumped in price 3 to 4 times.

**Other Factors**—Low price is not the sole reason for few foreign imports, though. There are also: 1. U. S. import duties of 10 to 20 pct; 2. European maximum capacity ratings (which soon may be adopted by the U. S. National Electrical Manufacturers Assn.); and, 3. "Buy American" clauses stamped right on U. S. purchase orders.

The variety of electrical power sources and codes around the world is another deterrent to opening the U. S. market to imports. But there are indications this may change.

**Code Confusion**—"There is no real European standard for welders and electrodes," reports one major exporter. "A Common Market meeting in May will try to work this out."

There is a regular hodge-podge of European codes now. Germans, French, and Dutch all rate their machines differently. In France, for instance, there are three different codes to meet.

Power sources tend to insulate the U. S. from other markets. Most of the world is on 380-v, 50-cycle power; the U. S. is on 220/440 v, 60 cycle.

**Cracker Boxes**—Most European builders make, what one exporter calls, "cracker box" transformer welders with practically no safety factor. They are protected by 100 to 300 pct import duties. So the main U. S. export is in motor generator sets and m-g power sources for automatic welding setups.

One U. S. company plans to build welding units in Europe for sale to Common Market countries. It isn't worried about foreign competition. Price and the heavier duty cycle will give the company an edge, it feels.

"A 300 amp U. S. model is the equivalent of a 400 amp unit there," says a spokesman. "Our units have 60 pct duty cycle on a full 300 amp rating, while European models have 55 pct on a 2-min rating."

**Not All Happy**—Some U. S. producers are far from pleased at their export - import position, though. They feel research and improvement have been sacrificed for low cost.

# Annual Embezzlements Soar

**Some estimates now place the annual take of dishonest employees in the U.S. at close to $1.5 billion.**

**But many companies don't take adequate precautions against the embezzlement threat.**
**By B. F. Surer**

■ Company embezzlement losses continue to rise. Some estimates put the annual take of dishonest employees in the U. S. at almost $1.5 billion. Compare this with loss estimates of $500 million in 1956.

And the ironical fact is that often management does nothing substantial to prevent or discourage employee dishonesty.

Executives still argue: "It can't happen at this company. Our employees are trustworthy."

But then it happens. The books come up short.

**More Women, Money**—Two developments have come to light from recent studies of embezzlers. First, more women are involved. Figures in one study in 1950 showed 845 men and 156 women charged with dishonesty. Today, this ratio gap has closed. The number of men and women embezzlers is nearly equal.

Secondly, when an employee steals now, he takes more than he would have a few years ago.

George A. Conner, vice president, Fidelity and Deposit Co. of Maryland, one of the nation's leading insurers against dishonesty, told The IRON AGE: "There once was a feeling among certain employees that the world owed them a living. Now, it appears, they have the feeling that the world owes them a darned good living."

**Basically Honest**—Mr. Conner says, however, that the premise that most embezzlers are basically honest still stands. "If they weren't trustworthy, they wouldn't be in a position, normally, to steal."

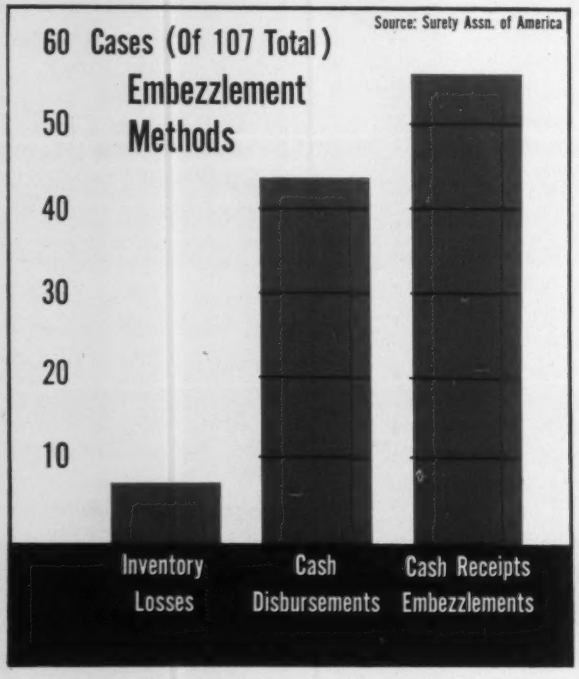
Why, then, do "honest and loyal" employees suddenly steal from company coffers?

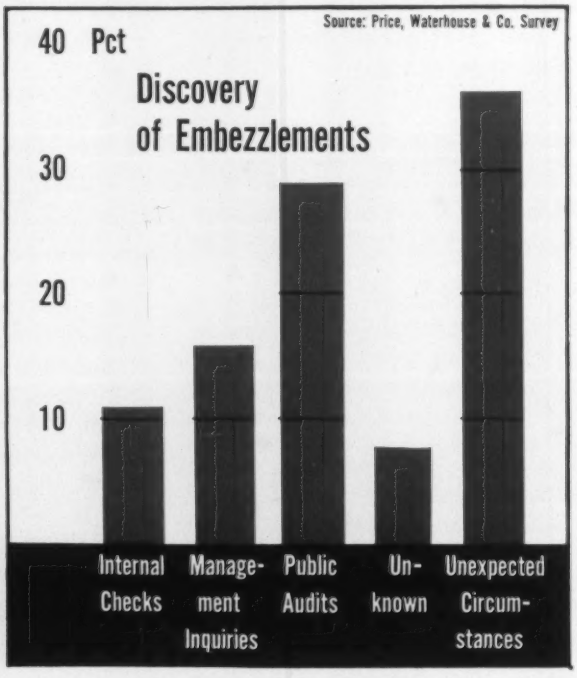
F. C. Ayres, assistant vice president, U. S. Fidelity and Guarantee Co., says, "These employees are usually faced with a problem they can't talk over with someone else. Normally, it's a financial problem. Because of this, they yield to temptation—often intending to pay the money back. But it snowballs on them, and then it's too big or too late."

Mr. Ayres also points out that many people wouldn't think of stealing money, but have no conviction about stealing property.

**Too Easy**—But the fact remains, that in many cases it's too easy for an employee to steal. Lester A.

## How Thefts Occur . . . And Are Discovered



Pratt, a specialist in employee fraud investigations, says: "There is an alarming degree of inefficiency in the average company's defense against employee frauds."

Here's a good example. A plant accountant, employed by a Midwest auto parts manufacturer for 16 years, operated a full-scale fraud scheme. He ran a company-supported cafeteria as his business and kept the profits; operated a company newspaper with revenue from ads going into his pocket while the company paid the bills; used company personnel for work at his home and billed the company; materials used in his home improvement were paid for by the company.

Also, he submitted bills for management dinners that never took place; and he sold company scrap and equipment, but kept the money. The accountant carried on his "private enterprise" for six years. When he finally was caught, the company had lost $125,000.

**Scrap Purchases**—In another instance, an employee of a scrap dealer on the West Coast faked purchase invoices for a period of 20 months. This practice came to light after a loss of $33,740.

How can management guard against employee fraud?

Says Mr. Pratt: "No one has yet discovered a sure-fire method of avoiding the employment of potential embezzlers. They follow no pattern and show no recognizable outward signs. They may be 18 or 80; work for a company for four months or 40 years; be paid $1800 or $18,000; and steal anywhere from a few dollars to many thousands of dollars."

But certain steps can — and should—be taken.

F&D outlines these precautions: Modern methods for hiring, training, and paying employees; cash funds subject to daily accounting; pre-numbered sales forms; checks signed only after full inspection; invoices signed after a merchandise study; regularly controlled inventories; and economically routed shipments.

**An Obligation**—Mr. Conner says "management has an obligation to its employees to set up an efficient system of checks and controls in order to remove temptation. . . ."

He points out that the above methods can often be back-stopped with a personal touch. For example, "An employee should feel free to discuss any problem—financial or otherwise—with his superior. I actually know of cases where a salary increase or a loan at the proper time would have prevented a major loss."

That management often refuses to admit an embezzlement potential is reflected in these facts: Only 10 to 15 pct of American businesses carry any form of fidelity insurance. And, often those policies that do exist are for small sums.

Take, for example, the case of an office manager at a Midwest tool plant. He had been employed for three years and was considered trustworthy. However, over a period of 15 months, he added fictitious names to the payroll and pocketed the money. The company discovered—too late—the loss of nearly $41,000. The insurance policy paid $12,500.

**Property Too**—Some companies lose large sums through the theft of property. A plant engineer for a Michigan manufacturer began juggling purchase orders after only four months of employment. He disposed of equipment on the side and kept the money. Fifteen months later, a customer complaint led to an investigation which turned up a $400,000 shortage. The insurance coverage was $50,000.

In many cases, dishonest employees end up in prison. There are probably just as many cases, however, where the employee is fired but faces no legal action. This is especially true when he has been a long-time member of a company staff.

Also, insurance companies note that many employers are reluctant to publicize employee fraud. "They feel," says F&D's Mr. Conner, "that it puts them in a bad light with their creditors."

## Watch for These Traits . . .

**What signs point to a potential embezzler? Roy C. Taylor, business control analyst, lists these factors as "possible" signs:**

- 1. Borrowing small amounts from other employees.
- 2. Placing unauthorized I.O.U.'s in change funds.
- 3. Replying with stilted explanations to any form of investigation.
- 4. Excessive drinking, night clubbing, and association with questionable characters.
- 5. Explaining that a high standard of living is possible because of an inheritance. This often warrants a confidential investigation.
- 6. Getting annoyed by reasonable questioning—but then staying calm under severe questioning.
- 7. Rewriting records under the guise of neatness.
- 8. Refusing to take vacations and shunning promotions. This can denote a fear of detection.
- 9. Constant association with, and entertainment by, a supplier.

**Close-Up Of Industrial Red China**

# How Fast Is Red China Moving?

**This is the final part of a series of stories written by Editor-in-Chief Tom Campbell while on tour of the Far East.**

**In this article, he analyzes conflicting reports on the industrial growth of Red China.**

■ It depends on whom you talk to whether or not Red China is making the grade industrially. Also it depends on where you are when you are digging up your information.

Learned reports suggest that Red China is up to the West on coal mining, ore smelting, steelmaking, and ore beneficiation. But that's not the whole story.

**Larger Only**—There is always the catch that people making these reports are talking about the "larger" units. Little is said about the smaller plants and little about the vast amount of human labor that is being used.

Probably the best way to sum this up is:

**The Red Chinese have made good progress—relatively—on the whole economic front.**

**They have made progress with many blast furnaces and steel plants.**

**They are doing well in ore extractions, nonferrous operations.**

**Their major steelmaking methods are as good as and in some cases better than in Russia.**

**They will, in the next 10 years, perhaps become the third or fourth largest steelmaker in the world.**

**Lots of Ifs** — This is not the main story though. There are a lot of "ifs." And these "ifs" cannot be proved down to the last letter. Again it depends upon whom you talk to.

For instance, one expert in Hong Kong who talks to people "just back" says that the Red Chinese are far smarter than the Soviets. He says with all sincerity that the Soviet technicians left China because the Chinese figured the Soviets did not know very much.

**Other Side** — Talk to another fellow who claims just as much knowledge of what goes on in Red China and you get another story. This man says, "They are lying through their teeth. The production figures are greatly inflated. You can't believe what they print and there is a big question on the quality of their pig iron, their iron ore and their steel."

Turn to a report by a Bureau of Mines man and it appears progress has been made; the technological advances are real; and China is on the way to being a world power—at least metallurgically.

**Middle Viewpoint** — Ask a trusted Japanese official who has visited the nation and knows its iron and steel industry and you get a story like this:

"As to the big blast furnaces the material is good. But when you come to the smaller backyard type

**PRIMITIVE:** Manpower is cheap in Red China. These workers loading ore for Red China's steel industry still work under primitive conditions.

of smelting plants, you can not say the quality is good at all. Also, if this pig iron is used in steel it stands to reason that the steel will be inferior in quality. I am sure that the figures are exaggerated, that the quality is poor in the majority of cases."

**A Yardstick**—Others might say this man is prejudiced against the Red Chinese. But his opinion is backed up to the hilt by a U. S. specialist in the Hong Kong area.

In sifting down these various opinions, it does not mean the Red Chinese are not making progress. They are, when measured against what they were doing some years ago. But it will be a hard task to tell for sure just what is being done.

Here are a few for instances:

Last year the Red Chinese said they had produced 19 million tons of steel while at the same time they said they had produced 28 million tons of pig iron.

At the same time, they said they had produced more than a 100 million tons of iron ore.

No figures were given last year for rolled steel.

**An Evaluation**—Here is the way one specialist, in a personal interview, sizes these things up:

1. He doubts the tonnage figure for steel. And even if it were made, he doubts the quality and suggests that much of the steel is no good.

2. He also doubts the pig iron figure. It is too large. Also, he says the quality is bad except pig iron from the larger furnaces.

3. The iron ore output figure is wide open to question.

**Conclusions**—The final judgment seems to be something like this:

**The Red Chinese are giving the people far more than the old rulers did. So, measured against what had been done, there is great progress.**

**There is dissatisfaction with the Soviet technicians. They are looked down on by the Red Chinese. Not merely as poor technicians but as inferior.**

**All figures as to output are subject to question, but the technology treatises are not bad.**

**Red China needs all the steel, iron, and iron ore it can produce for a long time to come. It needs the coal, too, because of the petroleum shortage.**

**Red China would like to get U. S. technical knowledge. (On a recent visit to China a personal friend was told, "We do not like the Soviet technology. We like the American brand and we also would like to get The IRON AGE regularly so we would be able to keep up with what is going on in the Western world of metals.")**

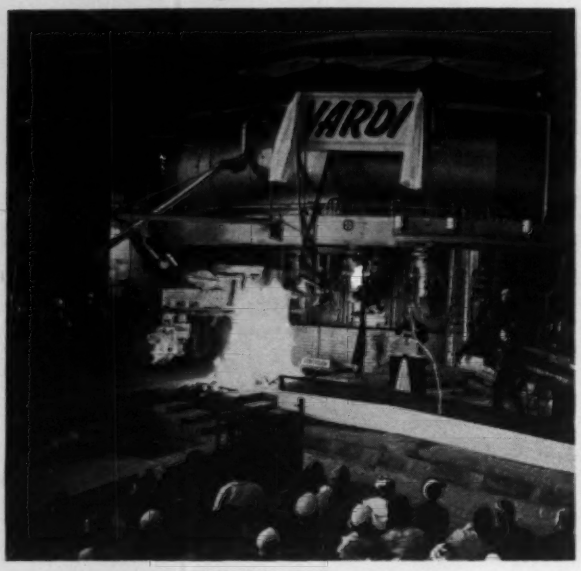
**Educated Chinese have joined the Reds because of a strong nationalism. It is much like the early Castro supporters. How long this will last is anyone's guess.**

It appears that there is a trade war brewing between Japan and Red China. The odds now favor Japan. What it will be in the next 40 years may be another question.

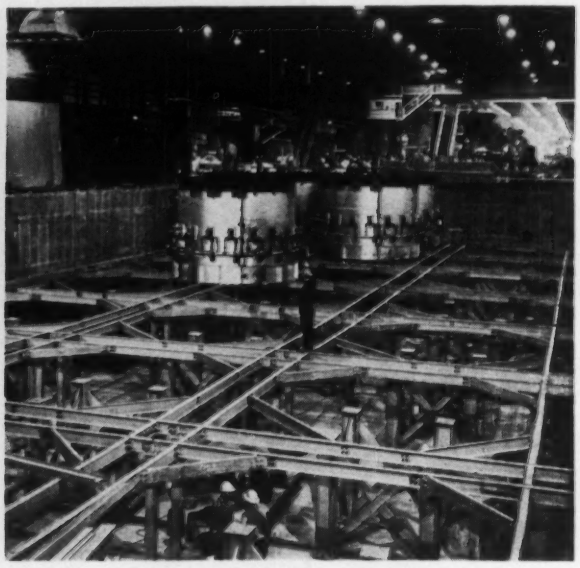
After more than a month of travel in the Far East and in South East Asia, it appears the odds favor the Japanese.

**MODERN:** In the modern laboratories of the Peking Iron and Steel Institute, Red Chinese engineers and metallurgists are trained in five departments. Classroom study is combined with practical training.

# Two Leading Steelmakers Unveil New Facilities



**BLOWING-IN:** Granite City Steel Co.'s new blast furnace was blown-in with 250 St. Louis business leaders watching. It will produce 2000 tons of pig iron.



**COILING-UP:** Open coil annealing facilities are taking form at U. S. Steel Corp.'s Irvin Works, Dravosburg, Pa. They will gradually be put into operation.

## New Oxygen Process First For Sharon

National Cylinder Gas Div., Chemetron Corp., Chicago, will build a new on-site air-separation plant at Sharon Steel Corp.'s Roemer Works, Farrell, Pa. it will be the first in the U. S. to use the new process for producing large quantities of liquid, as well as gaseous, oxygen.

The plant will have a capacity of 370 tons a day. It will also be the first NCG plant to deliver large amounts of nitrogen to a steel mill. Dravo Corp., Pittsburgh, will design and build the plant.

## Contracts Set For 5 Polaris Submarines

Definitive contracts have been awarded by the Defense Dept. for five more Polaris missile submarines.

The Electric Boat Div., General Dynamics Corp., Groton, Conn., received a contract for two submarines with a maximum price of $76.2 million.

Newport News Shipbuilding & Drydock Co., Newport News, Va., will build two submarines for $75.3 million.

Mare Island Naval Shipyard, Vallejo, Calif., will build the fifth.

## Fairbanks, Morse Bids Low on Generators

Fairbanks, Morse & Co., Chicago, is the apparent low bidder to supply generators for the Glen Canyon Power Plant, Arizona-Utah middle river division of the Colorado River Storage Project.

T. G. Lanphier, Jr., president, said the Fairbanks, Morse bid covers furnishing, installing and testing eight vertical shaft hydraulic turbine-driven, alternating current generators. Each will produce 125,000 kva, with 98.00 efficiency rating.

Bids came from eight suppliers. Final contract award is expected immediately.

## Fafnir Opens New Plant On 50th Birthday

Fafnir Bearing Co. has finished its new 460,000 sq ft plant at Newington, Conn. The company is marking its 50th year in business during 1961.

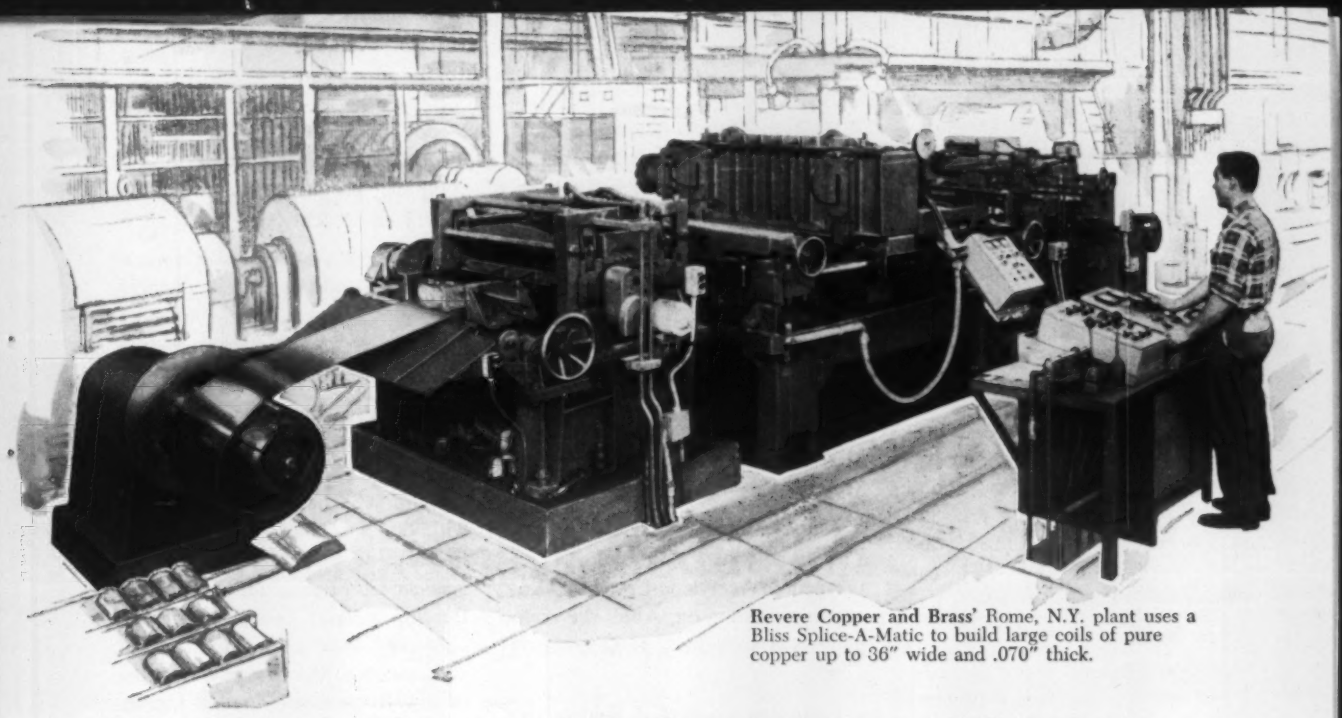
Features of the new plant include: (1) A continuous material and work flow system, beginning with raw steel stock and ending with scrap and chip disposal; (2) Unified coolant, electric power, supply and stanchion arrangement; (3) Underground coolant removal and filtration system for grinding operations; and, (4) Floor plan layout built around a "modular space" concept.

Balls, retainers and shields for bearings are made in separate Fafnir plants at New Britain, Conn.

## Congress Looks Into Missile Base Labor

Hearings have begun in Congress on wildcat strikes, work stoppages, jurisdictional disputes, excessive cost, waste and inefficiency in the missile construction industry.

Senate Permanent Investigations Subcommittee is probing allegations that **"some elements of labor have engaged in deliberate slowdowns to compel the payment of overtime and double-time."**



**Revere Copper and Brass'** Rome, N.Y. plant uses a Bliss Splice-A-Matic to build large coils of pure copper up to 36″ wide and .070″ thick.

# How much could these machines reduce your coil handling costs?

Substantially, if your requirements are at all similar to those of Universal-Cyclops Steel Corporation or Revere Copper and Brass. Universal-Cyclops uses a Bliss Splice-A-Matic welder to cut handling costs in welding carbon and stainless steels, getting ideal welds in even the 300 series.

Revere Copper and Brass uses *its* Splice-A-Matic to build up the larger coils preferred by many of its customers . . . now also finds that these larger coils cut down-time and set-up time in its own subsequent operations.

Just about any weldable material and coil size is practical with the Bliss Splice-A-Matic. It's been used on most alloys in widths to 60″ and with both coils and cut-to-length sheets. And complementing the Splice-A-Matic, Bliss offers a complete line of annealers, trimmers, pinch roll stands, levelers, reels, and other units to form a complete, modern coil build-up line.

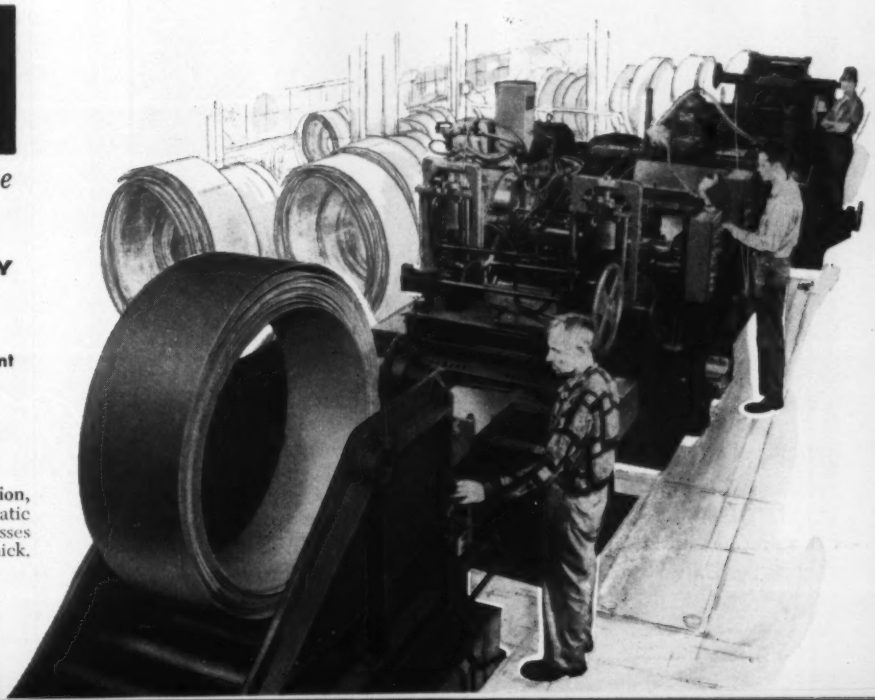
To learn how others are automating their coil handling and cutting costs write today for complete information.

BLISS
SINCE 1857 ®

*Bliss is more than a name*
*. . . it's a guarantee*

**E. W. BLISS COMPANY**
**Rolling Mill Division**
**Salem, Ohio**

**Subsidiary: The Matteson Equipment Company, Inc., Poland, Ohio**



**At Universal-Cyclops Steel Corporation,** Bridgeville, Pa., a Splice-A-Matic successfully welds 300 Series stainlesses 18½″ wide and 0.135″ to 0.195″ thick.

## INDUSTRIAL BRIEFS

**Joint Program**—Northern Natural Gas Co., Washington, and Houdry Process Corp., Philadelphia, have joined in a program to develop a natural gas fuel cell. Research will be done at Houdry's Linwood, Pa., laboratories.

**Canned Oil**—Anaconda Aluminum Co., Louisville, has successfully tested a foil-lined, spiral wound can for packaging motor oil. Sun Oil Co. has run trial production quantities of the new foil can through its Marcus Hook, Pa., packaging line.

**Campus Honors**—Case Institute of Technology, Cleveland, will name its new $2.7 million metallurgy building after Charles M. White, former board chairman and chief executive officer, Republic Steel Corp. It will be an integrated facility for the basic study of metals and other materials.

**Western Unity**—Seventeen independent steel fabricators and service centers have formed the Southern California Steel Council. Morris Rohrlick, General Pipe & Supply Co., is executive committee chairman.

**Welding Winner**—Julius Heuschkel, Westinghouse welding consultant in Pittsburgh, is the winner of the 1960 James F. Lincoln Gold Medal of the American Welding Society.

**Name Change** — NCG Canada, Ltd., is the new name of Alberta Oxygen & Acetylene Co., Ltd. Located in Edmonton, Alta., the company is a subsidiary of Chemetron Corp.

**Canadian Contact** — Hydro-Aire Co. Div., Crane Co., Chicago, has appointed Holden Co., Montreal, as sales distributor for the company's automotive and industrial products in Canada.

**Corporate Name**—McLanahan & Stone Corp., Hollidaysburg, Pa., has become McLanahan Corp. The company produces pit, mine and quarry equipment.

**Bigger Compound**—General Electric Co. will expand its phenolic molding compound plant in Pittsfield, Mass. The $750,000 addition will increase capacity 30 pct.

**Furnace Firsts**—Hevi-Duty Electric Co., Watertown, Wis., has built two special furnaces. A record-sized "clean-line" heat-treating furnace with double chambers was shipped to Large Jet Engine Dept., General Electric Co., Evandale, O., for heat-treating aircraft parts. Sibley Machine & Foundry Co., South Bend, Ind., received the first of a new line of low frequency induction melting and receiving furnaces.

**End of Line**—Colorado Fuel & Iron Corp. has finished its 69,000 v electric transmission line, part of a $2.2 million expansion program at the Pueblo, Colo., plant. The new loop will supply all departments, including the new oxygen steelmaking plant.

**Big Deal**—Machinery Sales Co., Los Angeles, has placed a $1.250 million order for machine tools with Bridgeport Machinery Co., Bridgeport, Conn.

**Chemical Contract**—Fluor Corp., Ltd., Los Angeles, will build a multi-million dollar oxo alcohol plant at Portsmouth, O., for Oxo Chemicals Co.

**New Plant**—New Jersey Zinc Co. is building a new electric furnace plant at Palmerton, Pa., to produce spiegeleisen, the iron-manganese alloy.

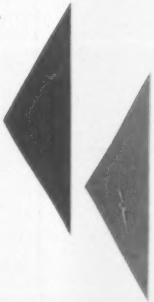
**Looking Ahead**—Sprayon Products, Inc., is building a $1.5 million aerosol packaging plant at Bedford Heights, O. It will combine activities of four smaller plants.

**Research Arm**—SKF Industries, Inc., is building a $1 million facility in Kilmarnock Industrial Park, Md., to research and develop special types of bearing production machinery.

## University of Detroit Honors Steelmaker

**CIVIC CITATION:** Paul H. Carnahan, left, president, National Steel Corp., received a civic citation from the Very Rev. L. V. Britt, S.J., president of the University of Detroit, during the recent Academic Convocation.

**In any language...**
**Clearing presses are**
**the way to more**
**efficient mass production**



here is the story

クリヤリング・プレスで
生産の飛躍

## and this is the result

four press lines like this one... including material handling, automation equipment and dies. The entire system is tested on Clearing's assembly floor.

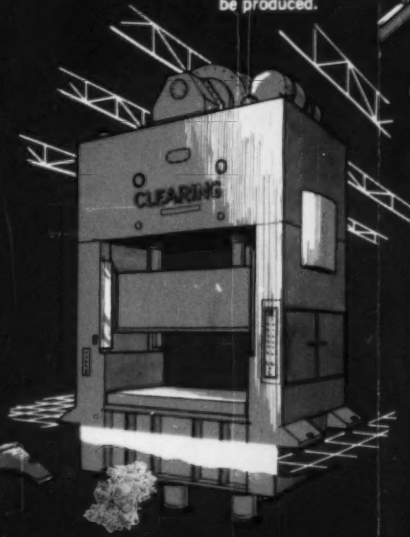
## run, tried and proved before delivery

Complete responsibility for the efficient operation of these press lines is assumed by Clearing. Our customer knows the equipment will work properly. He is relieved of the knotty post-installation problems of coordinating press operation with material handling. He knows his production rates per hour, per day, per month.

Press lines are headed by bottom-drive, multiple-action presses like this 1200 ton machine which perfor the first draw (as shown) on the fender.

WHATEVER YOUR

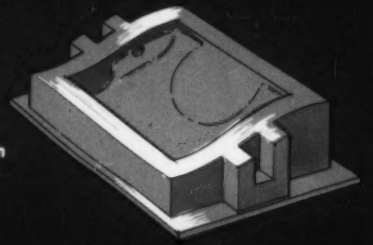
Follow-up operations are performed by Clearing straight side single action presses like the 500 ton machine shown at right. The press lines suggested for producing fender extensions are somewhat lower in capacity.

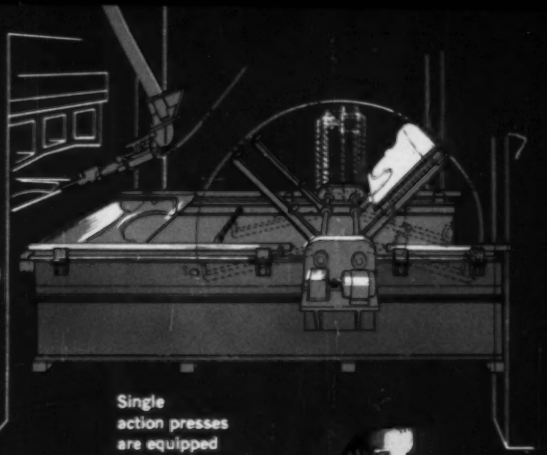



Clearing designed and built automated tables like this for hands-off materials handling between presses. Tables are adjustable so that parts of different size and shape may also be produced.

A mechanical unloading arm removes the piece-part after first draw. The part is automatically inverted by this turnover device so that the part goes into follow-up presses right side up.

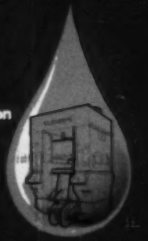
Responsibility for the fender dies is assumed by Clearing. The dies are designed and built while the presses are being constructed. At target date, the entire system is ready for swift, efficient, profitable production.





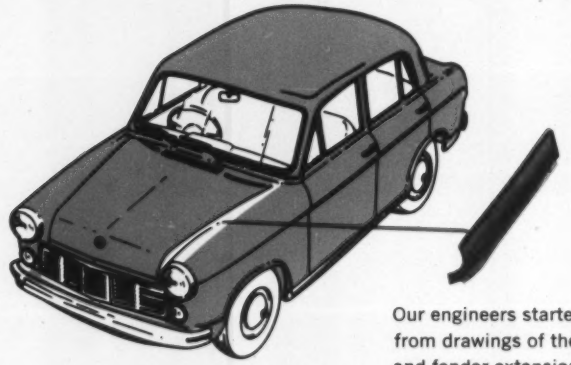
Single action presses are equipped with the famous Clearing Tornadyne Clutches. Dual speed clutches cut cycling time on multiple action presses.

All presses have Clearing's automatic oil lubrication system and many other Clearing exclusive design features.



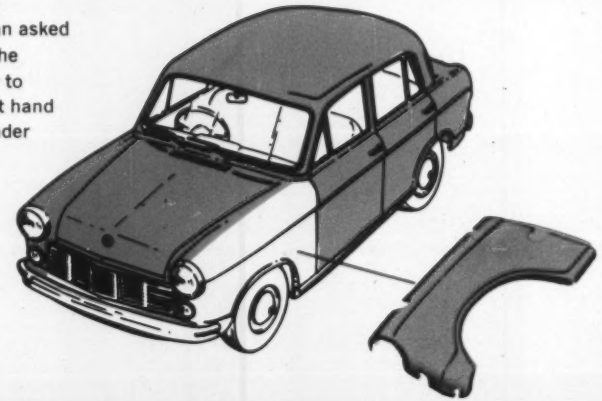
EVER YOUR PRODUCTION NEEDS . . . AN O.B.I. OR AN ENTIRE MANUFACTURING SYSTEM, LET CLEARING ENGINEERS HELP YOU FIND A BETTER WAY

## WE WERE ASKED TO TACKLE THIS PROBLEM

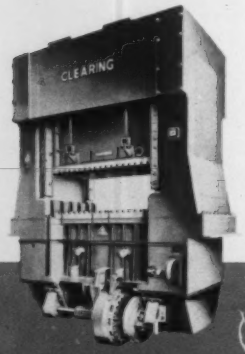


Our engineers started from drawings of the fender and fender extension shown here.

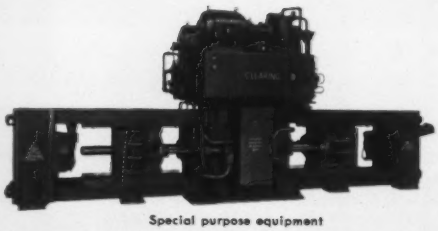
A leading automotive manufacturer in Japan asked Clearing to propose the equipment necessary to produce right and left hand front fenders and fender extensions.



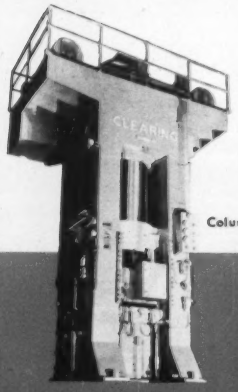
How best to do the job? What type of presses? What type of in-process handling equipment? These problems were tackled by Clearing's plans engineering group.




Bottom Drive, multiple action



Special purpose equipment

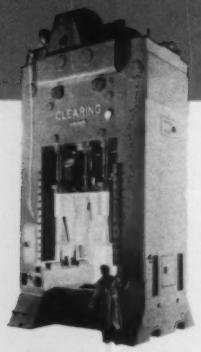



Column-Type Hydraulic

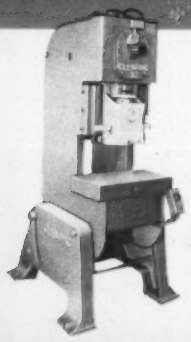
USI Clearing

DIVISION OF U.S. INDUSTRIES, INC.
6499 W. 65th Street, Chicago 38, Illinois

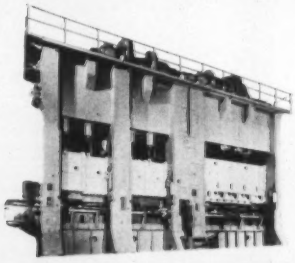
Clearing builds all types of press equipment from 22 tons upward. Whatever the problem, let Clearing recommend the equipment that is best for you.




Straight Side Mechanical



Open Back Inclinable



Automated Transfer Presses

# Can New Interest Policy Work?

**It's still difficult measuring the success of Administration plan to encourage long-term business borrowing.**

**But there are signs the new approach is working.**

■ How successful is the Administration's new policy on interest rates? Right now, it's hard to judge the program's progress. But the signs are encouraging.

The idea, you'll recall, is to reduce long-term rates, while keeping short-term rates strong. The aim: Encourage borrowing in the long-term market and stimulate business; hold up short-term rates to prevent the flow of loan funds abroad, seeking better rates. This flow of "hot money" overseas has been a prime factor in the drain on U. S. gold stocks.

**First Quarter Results** — One of the reasons why it's difficult to assess the new approach, is the recession itself. Even if long-term lending is encouraged, borrowers can't be prodded into it.

During the first quarter of '61, according to the Mellon Bank and Trust Co., the bank loan pattern "was obviously affected by recession conditions."

In January, the seasonal decline in loans was greater than usual. The February-March pickup was smaller than average. The Bank also notes, "Business loan demand at Federal Reserve member banks caused a large part of the relative weakness of loan trends in the first quarter."

**Against the Tide?**—FRB figures show interest rates on long-term corporate bonds declined slightly between early January and mid-April. This came despite some factors that might have pushed them up. The reviving optimism about business generally nudges rates up.

Recently the number and dollar volume of proposed corporate loans submited to the Securities and Exchange Commission reached record highs. Loans planned by state and local governments are also at high levels.

Inventory rebuilding, another strong reason for borrowing, should increase in the next few months.

**Short-Term Trends**—The effort to hold up short-term rates also looks promising. Firm short-term interest rates in the U. S., lower rates overseas, and government action have taken the pressure off the gold position, for the present.

Both the Treasury and the Federal Reserve are acting to improve the money market. But there are limits to what can be done. As William McC. Martin, Jr., chairman of the board of governors of the Federal Reserve, points out, "We have never intended to try to establish an arbitrary rate level . . . we recognize that effectiveness of FRB operations depends heavily on the reactions of investors . . . In our country, the Government cannot compel anyone to invest or lend his money at rates he is unwilling to accept . . . nor can it compel anyone to borrow at rates he will be unwilling to pay."

---

# Plan for Merged Automation

■ Plant automation and office automation are going to merge in the '60's. But it's up to management to make sure the meeting is a union, not a collision.

That's the opinion of George M. Muschamp, vice president of engineering for the Industrial Products Group of Minneapolis-Honeywell Regulator Co.

**Over-all Plan Needed**—Merging of company-wide automatic operations is a management responsibility, he says. "If there is no over-all plan to insure this compatibility, costly improvisations will result."

"The challenge is limiting the intolerable and costly overlapping which will come if we continue the separate pursuit of plant and office automation," Mr. Muschamp adds.

**Hopeful Signs** — Management's problems come from a lack of process knowledge in the plant, procedure knowledge in the office, and a "vast lack" of procedure standardization in both areas.

As hopeful signs that the two automation areas can be meshed, he notes these trends: The setting-up of some officer-directed task forces to study and plan the buying of automatic plant and office equipment with "common language" inputs and outputs. More recognition of the value of systems engineering.

# Now...a complete M&T plating "package" offers single responsibility for quality bright plating

It's now M&T all the way with a complete line of processes and supplies for copper, nickel, chromium plating. It's the same technical service man who now takes the trouble to keep trouble out of the whole bright plating operation.

More than this, each M&T process in the package brings genuine operating advantages. Each contributes to a quality finish. Related supplies are of the highest possible quality, backed by all of the know-how accumulated by M&T in over 50 years of serving the plating industry.

M&T offers several different types of copper plating materials to meet any plating requirement. Nickel plating materials include the finest type of anodes — produced by INCO, which appointed M&T an authorized distributor. In chromium plating, M&T's SRHS® Chromium Plating Compounds have no equal for speed and quality, especially for plating the thicker, more corrosion resistant chromium being specified today. They make up baths that are up to 80% faster than the ordinary chromium plating bath, and which control themselves automatically.

By any value analysis, there's dollar value in M&T's long experience in this field. Put it to work for you; let it help your company cut bright finishing costs, reduce trouble and rejects. It's part of the "package" — it costs you nothing. An M&T Plating Engineer will be glad to provide details.

**plating products** · welding products
coatings · chemicals · minerals · detinning

METAL & THERMIT CORPORATION, General Offices: Rahway, New Jersey
In Canada: M & T Products of Canada Ltd., Rexdale, Ontario

# What's Ahead for Chrysler?

## Dissidents Subdued, But More Changes Coming

**Chrysler Corp. survived its stockholders' meeting last week. But the facelifting operation doesn't appear to be over yet.**

**Sales are down considerably. And many observers feel more top-level changes are coming.**
**By A. E. Fleming**

■ Chrysler Corp. and its current management survived last week's stockholders' meeting. But there's not much doubt that more changes will have to be made as the company fights to hold on to its place as a member of the Big Three.

Whether or not L. L. Colbert remains as board chairman and president, reorganization will continue for months ahead. Little now remains of the corporate structure that started to crumble last year with the forced resignation of then president W. H. Newberg.

On the record, Mr. Colbert said 7000 salaried employees, including executives, had been taken off Chrysler payrolls since 1960. And more are to follow, he implied, as the company continues to lower the ratio of salaried to non-salaried employees.

**More Changes?**—Internal policing at a high level is still going on. And most close followers of the auto industry believe more high-level changes are coming after the noise of the stockholders' meeting fades somewhat.

Of course, whether it will fade entirely is in doubt. Many lawsuits remain to be argued and settled. The vocal critics of the company management are far from having been subdued.

However, most agree on one of Mr. Colbert's statements: The company has suffered since the questions of conflict-of-interest and charges of mismanagement were raised with the resignation of Mr. Newberg.

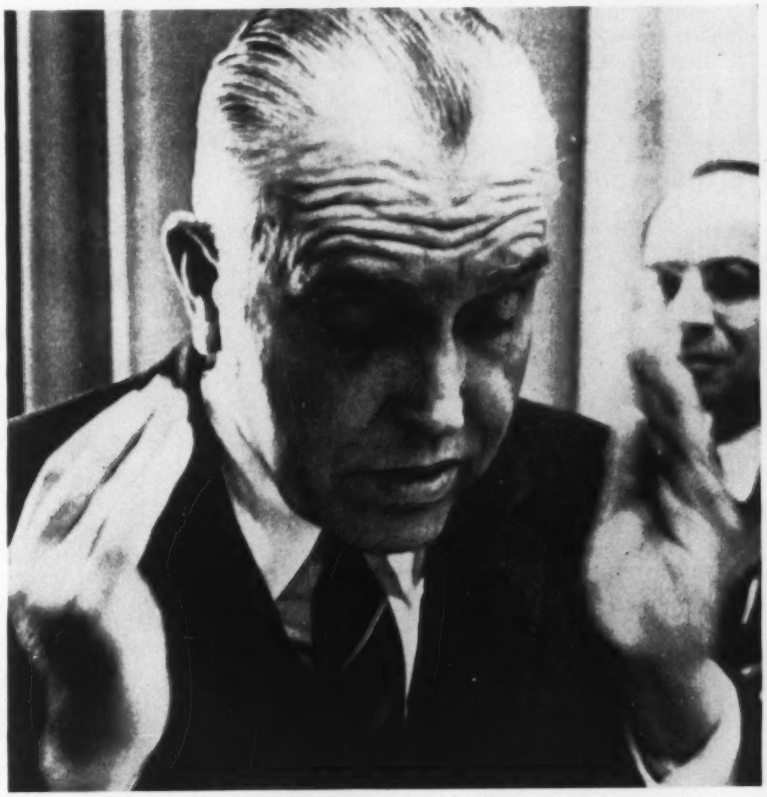
**Sales Drop**—While it is difficult to evaluate the effect on total sales, Chrysler's share is down to about 10 pct of industry sales.

Among the specific charges made at the meeting, S. A. Dann, a large stockholder and a vocal dissident, said Chrysler lost $40 million on premium steel payments last year. Mr. Colbert granted the company had bought $57 million in "penalty steel," but said it was necessary to build up production in the period of late 1959 and early 1960.

"We paid $40 million in 1959 and $17 million in 1960 for penalty steel," Mr. Colbert said. "Some of the steel was delivered after the strike ended, but the contracts were made when the strike was on. Other companies paid penalties, too."

**The Result**—"But," he said, "We couldn't have built the more than 300,000 cars we did in the first quarter (1960) if we hadn't paid the penalty price . . ."

Although the stockholders' meeting had been billed as a rebellion against Mr. Colbert, the weight of the votes was far on his side.



**UNDER FIRE:** Chrysler board chairman L. L. Colbert defends policies at annual stockholders' meeting. Dissidents failed to unseat him.

# CUTS MANUFACTURING COSTS OF EXPORT PARTS TO MEET FOREIGN COMPETITION

Assignment was to design and build a machine to process large domestic aluminum transmission covers through one sequence of operations and smaller export covers through a different sequence. One machine to do both jobs would, naturally, save money. The job was slightly complicated by production ratio of one export part to four domestic; the machine to accept these parts intermixed at random and run them through automatically.

The assignment was carried out successfully and covers made here are built into foreign cars at cost competitive with local production overseas.

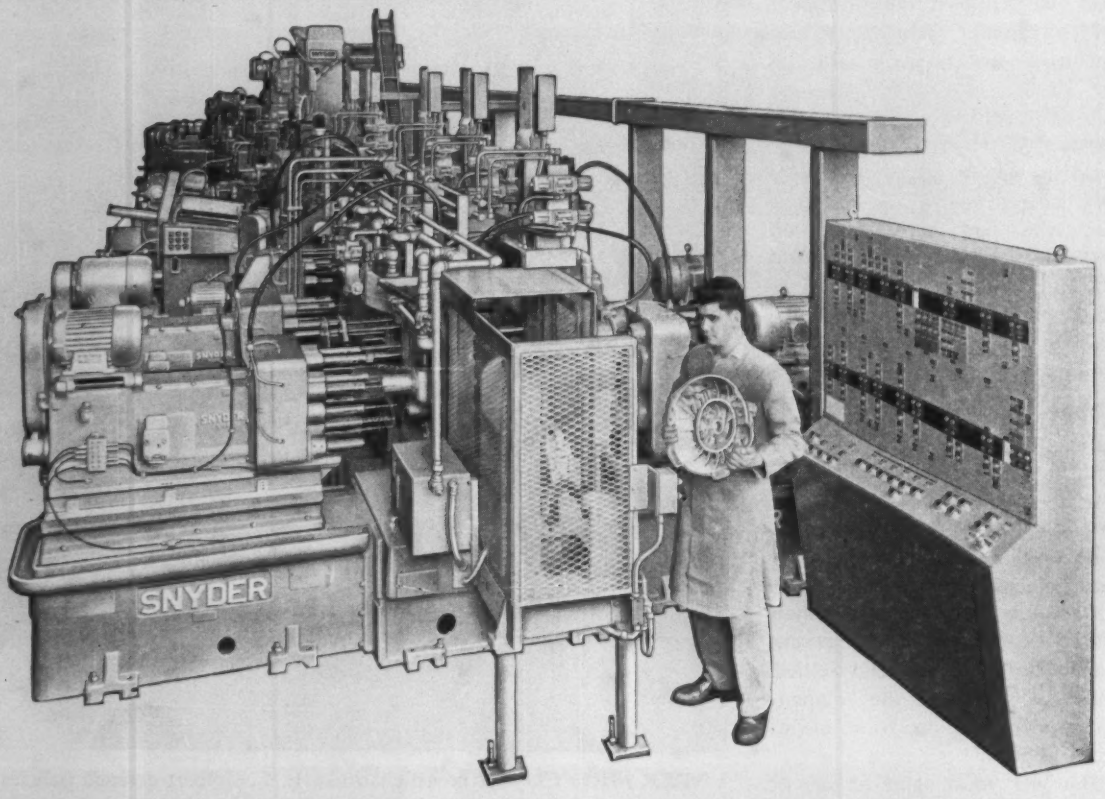
The fact is that U. S. experience, know-how, fresh approach and creative ideas *can build and are building* machines to offset foreign cost advantages. And the same cost-cutting techniques can be built into machines to offset regional manufacturing cost differences. Here at Snyder we're particularly experienced in this because we've been designing and building such machines for both domestic and export markets for 35 years. May we help you?

**SNYDER**

**CORPORATION**

**3400 E. LAFAYETTE—DETROIT 7, MICHIGAN**

**Phone: LO 7-0123**



# Aerospace Hunts New Metals

## Lockheed President Calls for Materials Specialists

**Aerospace demands will open new metalworking markets.**

**Lockheed Aircraft's president sees a need for companies that will develop new materials and manufacturing techniques.**
**By R. R. Kay**

■ Aerospace is opening new worlds for materials and manufacturing methods. The challenges are exciting. And the rewards are bound to be great.

It's a field that metalworkers—small and large—can't afford to overlook.

That's the prediction of C. S. Gross, president, Lockheed Aircraft Corp.

**Not Suitable** — Here's how Mr. Gross sees it: "Most available materials are inadequate for the high-performance end items designed for space environments of high temperature, radiation, etc.

"There is a need for the specialist —a small company with a formula for a lubricant, for example, that will work at 2800°F, or a new adhesive that will be effective over long periods at 900°F."

**Fewer Joints** — Manufacturing processes also are changing. Mr. Gross points to the trend to fewer structural joints. This means less welding, riveting, and bonding.

Plenty of answers are lacking in machining new high strength, high temperature materials.

What techniques will get more and more attention? Chemical milling, and ultrasonic and electrical discharge machining.

**Old School**—"It's apparent that opportunities are declining for the old-time sheet metal company and for the machine shop that's doing the conventional thing in the conventional way.

"The future will favor the company abreast of technological developments; the one that has strong design competence, special facilities, imagination, and foolproof quality control," says Mr. Gross.

The transition from planemaking to missilemaking still goes on. Look at Lockheed. Just five years ago, 94 pct of its business was making aircraft. Today, it is only 44 pct. More than half of its volume is in missile and space.

### Boeing Bounces Back

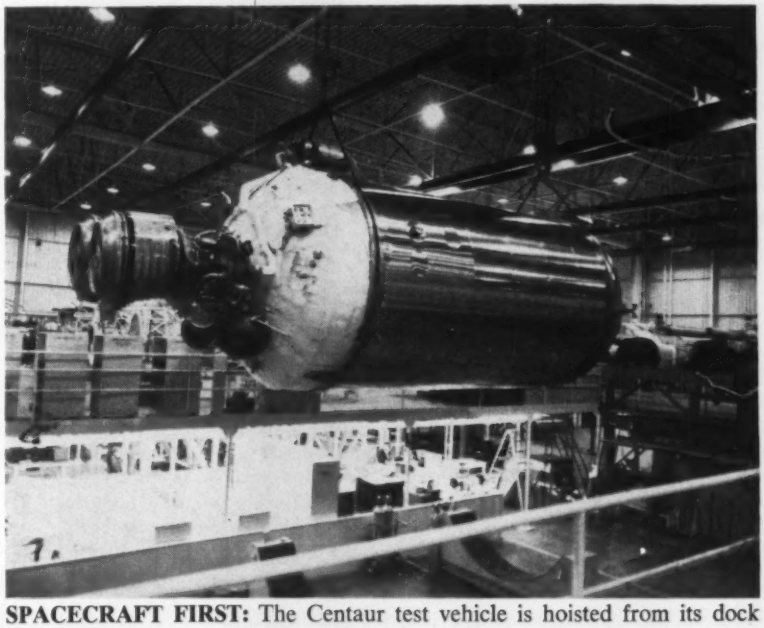
Things are looking up a bit in the Seattle area. Boeing, number one factory employer in Washington, plans to take on 3000 more workers this year.

Boeing certainly has had its ups and downs. Its employment dropped from a high of 72,000 to 57,000 today. The company pays out $556 million to its employees. A healthy share of it goes into the Seattle area.

**Star Bright**—Right now, Boeing's star is shining bright. President Kennedy's new budget request has the company scheduled for an extra $191 million.

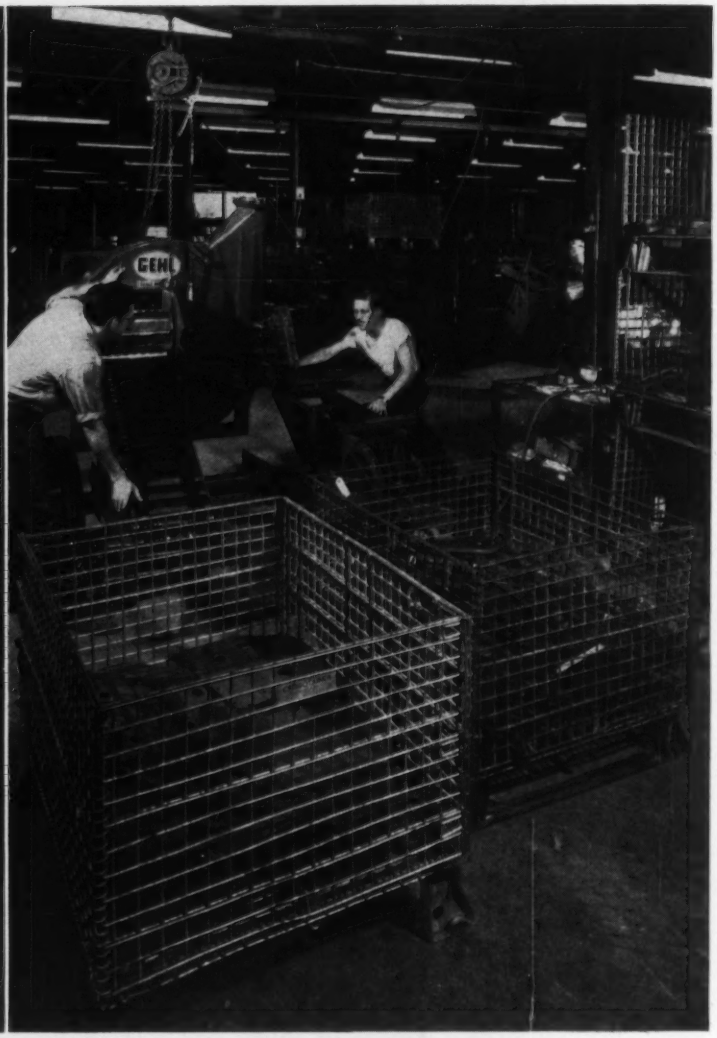
On top of that, Boeing hopes that its DynaSoar sub-orbital manned glider might get half of the $226 million the President is asking for space and research programs.

## Rocket Nears Its First Test



**SPACECRAFT FIRST:** The Centaur test vehicle is hoisted from its dock at General Dynamics Corp.'s Convair Div. plant in San Diego. It is the first high-energy U. S. rocket to be powered by liquid hydrogen.

# FARM EQUIPMENT BUILDER Reaps $120 Savings WITH EACH CARGOTAINER



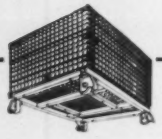

# 2100 CARGOTAINERS® increase production for Gehl Brothers

Gehl Brothers Manufacturing Company, farm equipment builder, has standardized on CARGOTAINERS for storing and transporting machinery parts. Results add up to a savings of $120.00 annually for each of these wire mesh containers in use.

CARGOTAINERS save this company $1,000 a month in handling costs alone. Cleaning and degreasing operations have been cut by ten hours. Parts formerly shipped loose in trucks took three men 2½ hours to unload and weigh. This is now done in 15 minutes by two men, with CARGOTAINERS.

This is one of many case studies which prove CARGOTAINERS best for handling and storing parts and materials. Cleanliness, visual inventory and collapsible features make these wire mesh containers ideal for your application. Stacked three high, they save thousands of feet of floor space.

Write today for brochure on various models and sizes.



**CARGOTAINER**
DIVISION
TRI-STATE ENGINEERING COMPANY
WASHINGTON, PENNSYLVANIA

mhi MEMBER

# Hand Assembly: Does It Pay?

## Old Idea in New Form Can Help Smaller Plants

**Small plants and job shops can now adapt a new concept of the old individual build idea.**

**It will ease the pains of frequent model changes and can reduce assembly costs.**

**By R. H. Eshelman**

■ Not all technological advances are in new machines that mechanize many operations.

Smaller plants and job shops often feel transfer lines are strictly for high volume production. Yet today's markets and custom products are altering the production ideas of many mass producers, including automotives.

**Hold Cost Line**—Manufacturing experts are seeking ways to curb climbing costs in custom production. They are finding excellent answers to even such bottlenecks as small lot assembly.

A simple but effective method is described by P. W. House, works manager of Delco-Remy Div., General Motors Corp., as "individual build."

**New Concept**—Individual build in assembly is as old as metalworking. Mr. House recently told the national production meeting of the Society of Automotive Engineers that some would call it a kickback to the hammer - and - screwdriver days of hand work.

Still, he points out, there's far more to it than that. Actually, it's a new concept of assembly tailored to today's special needs.

**Better Deal**—Basically, it starts with better handling of parts. Assembly components are systematically arranged for an operator. He, in turn, is trained in the best method (motions and sequences) of putting together the assembly.

In making this human engineering and methods analysis, the production engineer must explore all avenues. He must consider mechanical aids, mechanized conveying and feeding, and other helpful devices.

**None Finer** — "The individual build presents benefits, even with high production requirements, that cannot be realized by any other method," says Mr. House.

The system creates a feeling of responsibility and better worker morale, too, he says. It often reduces cost as skills develop.

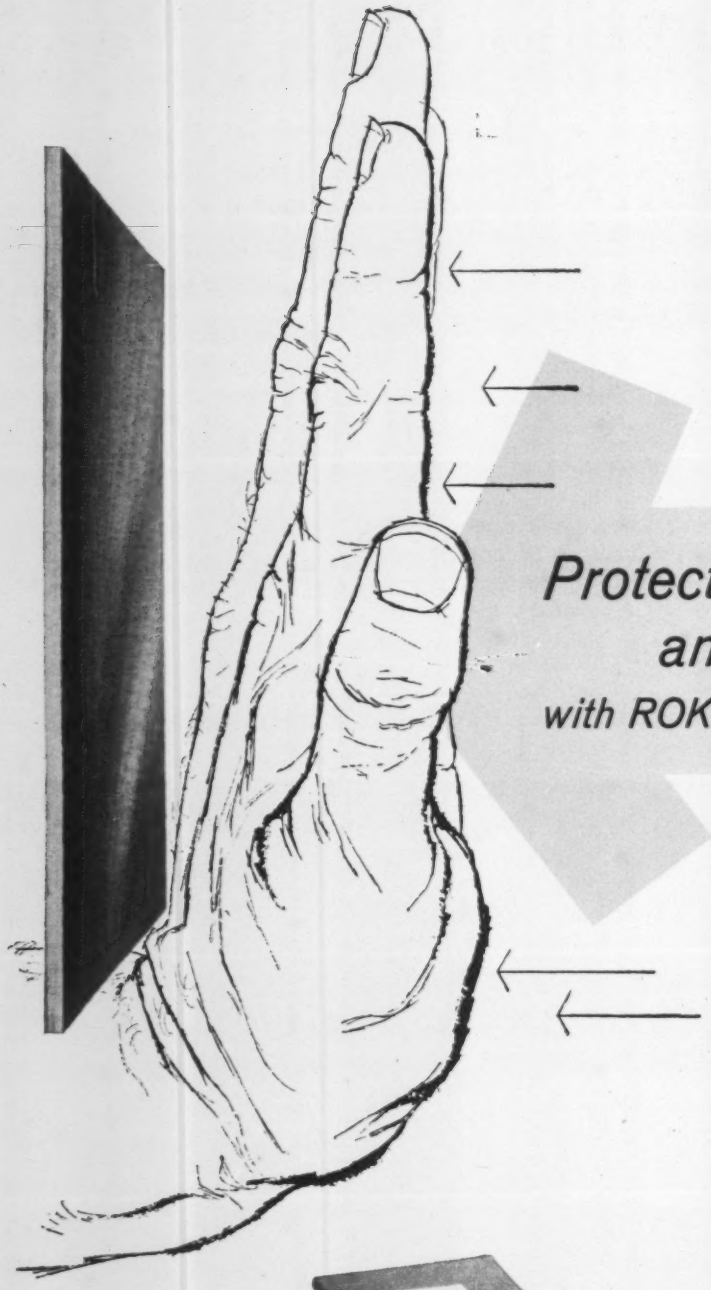
One big advantage over automatic feeding is that parts can be used which are within print limits but not within required tolerance for automatic handling equipment.

**Schedule Changes**—With several individual stations for putting together similar assemblies, a change in schedule can be made readily. Efficiency is undisturbed. And several models of a product can be run at the same time.

Utilizing the judgment and skills of the worker, with repetitive capacities of mechanized equipment, can and does pay off.

**Little Boon**—The method allows smaller plants to adapt many new advances in materials handling.

**HUMAN ENGINEERING:** Workplace layout for individual build of solenoid switch at Delco-Remy Div., General Motors Corp., arranges parts, stock and components so that entire operation is done safely and efficiently.



Here's the fast, economical way to protect vital parts and equipment against temperatures up to 4600°F . . . extreme abrasion . . . electrical energy . . . erosion and corrosion. Simply apply ROKIDE Ceramic Coatings — hard, crystalline refractory materials — which provide *positive* protection.

ROKIDE Coatings are supplied in rod form as "Z" Zirconium Oxide, "A" Aluminum Oxide, "C" Chrome Oxide, "ZS" Zirconium Silicate, and "MA" Magnesium Aluminate. To apply, rod is heated and the molten particles projected at high velocity against the prepared surface, where they adhere and solidify.

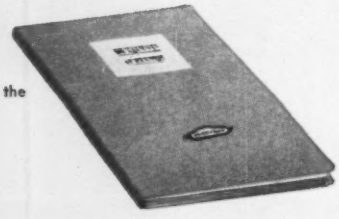
ROKIDE Coatings are extensively used for both military and industrial applications such as: missile components, bearing surfaces, extrusion dies, furnace and feed rolls, induction coils, igniter tips, strain gages, buffing fixtures, mechanical seal rings, pump shafts, capstan wheels, impellers, crucibles, etc.

ROKIDE Coatings are available from a number of strategically located job shop applicators or direct from Norton Company, Worcester, Mass., and Santa Clara, California. Find out how they can cut *your* maintenance and production costs. NORTON COMPANY, 203 New Bond Street, Worcester 6, Massachusetts.

# *Protect modern metals and materials*

## *with ROKIDE* Ceramic Coatings*

*Trade-Mark Reg. U. S. Pat. Off. and Foreign Countries



Write for full details on the ROKIDE Coating Process.

**NORTON**

**REFRACTORIES**

*Engineered . . . Rx . . . Prescribed*

*75 years of . . .* Making better products . . . to make your products better

**NORTON PRODUCTS:** Abrasives • Grinding Wheels • Machine Tools • Refractories • Electro-Chemicals — **BEHR-MANNING DIVISION:** Coated Abrasives • Sharpening Stones • Pressure-Sensitive Tapes

**J. W. Herman,** elected vice president and treasurer, Lukens Steel Co.

---

Raybestos-Manhattan, Inc.—**J. N. Kuzmick,** elected vice president.

General Electric Co. — **D. A. Yates,** named manager, systems procedures and practices; **C. B. Elledge,** named manager, industrial sales and engineering; **G. R. Brown,** named manager, metal rolling industry sales; **W. E. Miller,** named manager, metal rolling application engineering; **L. F. Lewis,** named manager, advance planning and projects; **F. M. Roberts,** named manager, application engineering development.

Pittsburgh Plate Glass Co.—**C. R. Holman,** appointed vice president, manufacturing, paint and brush div.

Tubular Service Corp. — **H. L. Bialock,** named president.

Treadwell Engineering Co. — **F. R. Curry,** named president. He succeeds **G. R. Casey.**

Cleveland Instrument Co. — **F. W. Witzke,** appointed vice president and chief administrative officer.

Dayton Malleable Iron Co. — **J. F. Torley,** elected president and general manager.

Fairchild Engine & Airplane Corp.—**J. C. Hoffberger,** elected director.

Luxo Lamp Corp.—**S. F. Blake, Jr.,** appointed vice president, eastern sales.

Kent-Moore Org., Inc. — **Merle Crandall,** appointed treasurer.

Dayton Industrial Products Co. —**D. N. Goss,** named district manager.

Crucible Steel Co. of America— **J. E. Holt,** appointed assistant to the vice president, operations, production.

**P. H. Ponta,** appointed director, manufacturing staff, Ford Motor Co.

---

Crane Co.—**N. B. Champ, Jr.,** elected vice president.

Pierce Industries Inc. — **L. E. Boren,** named president and chief executive officer; **F. J. Purcell,** elected secretary; **Ray Lawton,** elected treasurer; **Allen Reinhart,** elected assistant secretary.

General Dynamics Corp.—**J. W. Carley,** appointed product manager, automotive products, and **L. M. Schachere,** named eastern regional manager, consumer products, Stromberg - Carlson Commercial Products Div.; **R. F. Jacque,** appointed manager, quality assurance, Military Products Div.

**(Continued on P. 96)**

**Tore Wallin,** appointed asst. to the vice president, operations for engineering, Crucible Steel Co. of America.

**Dr. H. I. Ansoff,** appointed general manager, information technology div., Metuchen, N. J., Lockheed Electronics Co.

**R. H. Ruud,** elected a vice president of North American Aviation, Inc., and named president of the Los Angeles Div.

# MARKING MACHINES and TOOLS

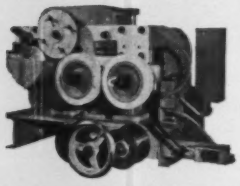
**MULTIPURPOSE MACHINES**

For indented, roller method marking or stamping of trade names, trademarks, part numbers on round, flat or contoured parts. Full pneumatic, Hydra-Pneumatic and manually operated models available.

**BLAST-ETCH MARKING**

The Matthews Air-grit takes only a half-second to permanently mark delicate parts or hard to mark surfaces like glass, plastic, steel, carbide or anodized aluminum.

**PRINTING MACHINES**



Matthews Printers may be installed in your line to mark sheets, tubes, wire, bars, etc., as fast as they can be fed.

**NAMEPLATE MARKING**

Complete line of nameplate panel marking equipment. From hand operated to 5000 per hour automatics.

**JAS. H. MATTHEWS & CO.**
3962 Forbes Ave., Pittsburgh 13, Pa.
Offices in Principal Cities


**(Continued from P. 95)**

General Electric Co.—**D. C. Kyker,** appointed manager, materials, outdoor lighting dept.

American Viscose Corp.—**Julian Robbins,** named sales representative, Industrial Packaging Dept., Los Angeles district office.

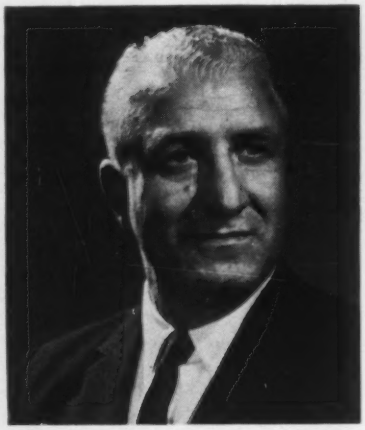
**Dr. S. T. Ross,** named vice president, research & engineering, Brooks & Perkins, Inc.

---

Koppers Co., Inc.—**T. E. Reitz,** named manager, inspection section.

National Malleable and Steel Castings Co.—**S. D. Sanders,** named manager, Cleveland Works.

Loewy Machinery Supplies Co., Inc.—**Alfred Loewy,** elected chairman of the board and chief executive officer.



**A. R. Clayton,** appointed director of manufacturing, military products div., General Dynamics/Electronics Div., General Dynamics Corp.

**M. G. Channing,** appointed vice president, planning, Pratt & Whitney Co., Inc.

---

Pennsalt Chemicals Corp.—**L. T. Geiger,** appointed plant manager.

Sylvania Electric Products Inc.—**E. E. Broker,** appointed general manufacturing manager, Parts Div.

United States Steel Corp.—**J. G. Morrison,** appointed manager, sales, National Tube Div., New York district office.

A. O. Smith Corp.—**P. S. Blake,** named director, manufacturing, Automotive and Railway Products.

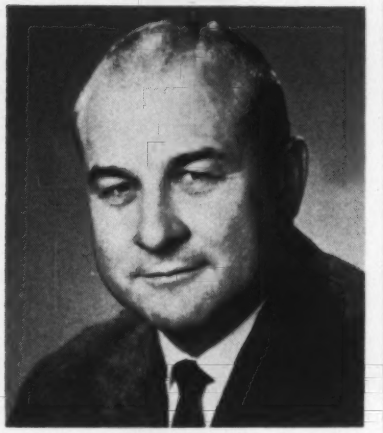
**H. M. Small,** appointed division manager, Buflovak Equipment Div., Blaw-Knox Co.

---

C. O. Jelliff Mfg. Corp.—**D. W. Sullivan,** named asst. sales manager, Mesh Div.

Chapman Valve Mfg. Co.—**E. H. Kolb,** appointed vice president and general manager.

Keuffel & Esser Co. — **A. E. Busch,** elected president.



**W. O. Fitzke,** named superintendent, mechanical dept., Republic Steel Corp.

**H. V. Gumma,** appointed superintendent, rolling and finishing depts., Colorado Fuel & Iron Corp.

---

Cooper-Bessemer Corp.—**R. L. Boyer,** named vice president and director of engineering.

Fire Clay Co.—**G. W. Jensen,** named president.

Grove Valve and Regulator Co. —**J. W. Collins,** named president. General Motors Corp. — **A. F. Power,** elected vice president and general counsel.

Allis-Chalmers Mfg. Co.—**J. H. Bates,** appointed business manager, foundry and forge operations, West Allis Works; **H. L. Matzner,** appointed works comptroller, West Allis Works.


# ROLLING MILL SUPT. reports:

*Soffel's*

## EXOTHERMIC SIDEBOARDS

**Increase Slab Yield 5 to 8%**

***...even more in our "out the door" products***

"By increasing yield in the ingot with Soffel's Exothermic Sideboards, we increase our slab yield even more. By the time our finished products go out the door we have added substantially to our volume. Sure, we like Sideboards. They make plenty of dollars and sense to us."

**PRODUCT ADVANTAGES**

- **Eliminate permanent and conventional hot tops.**
- **Easy, and single, stripping of Big End Down molds.**
- **Sideboards are easily placed in head of mold by one man — crane only necessary on very large ingots.**
- **Longer mold life — less mold cost — less mold inventory to carry.**

***Soffel's Exothermic Sideboards increase ingot yield, assure top cut soundness and provide more ton steel out the door per ton of steel in the ingot.***

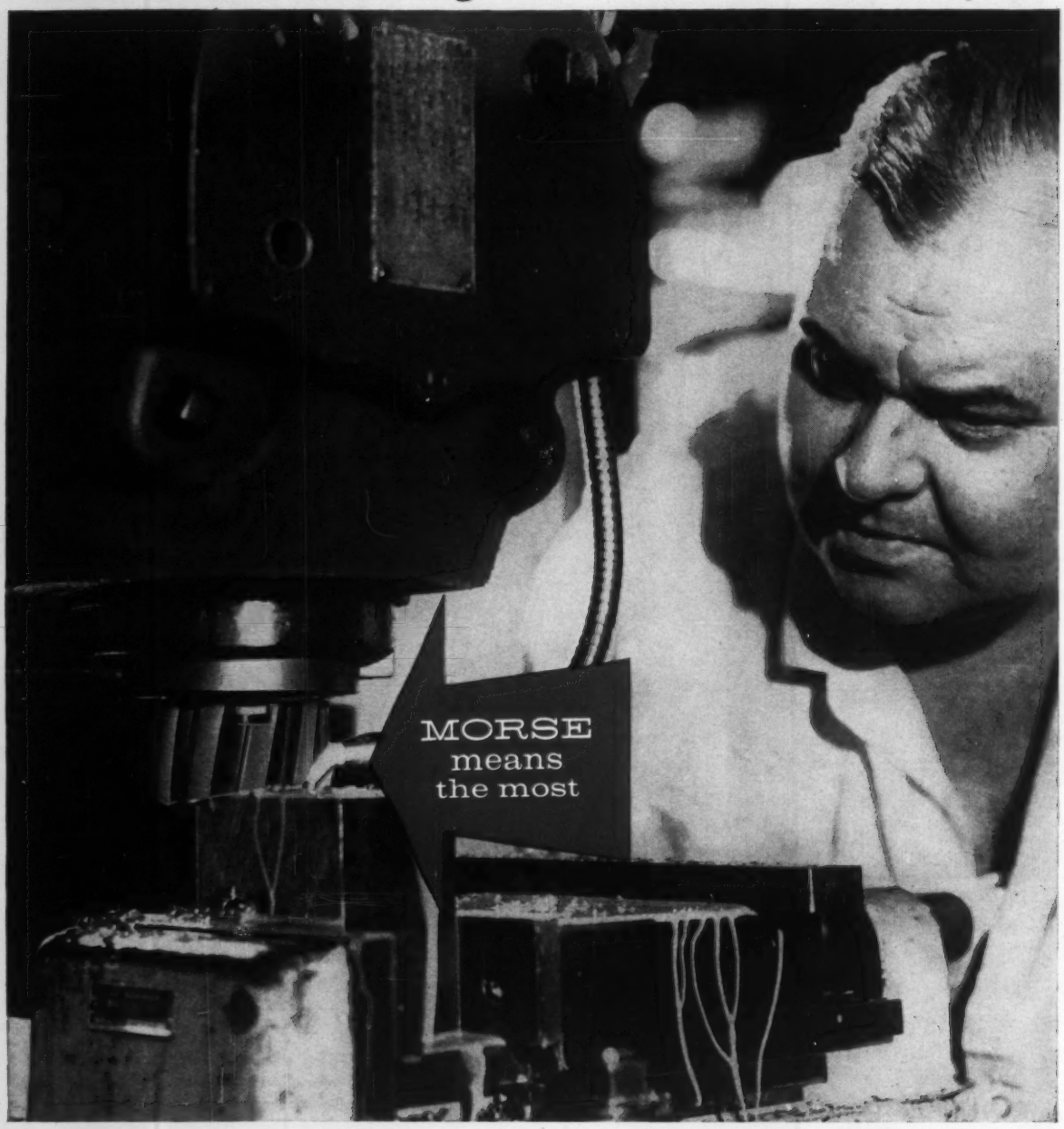
**Phone NAtional 5-1571**

**Pittsburgh Metals Purifying Co.**

A Division of Treesdale Laboratories, Inc.

MARS, PENNSYLVANIA

with men who know cutting tools... it's **MORSE** everytime




TRY **MORSE**... BUY **MORSE**
SEE YOUR NEARBY **MORSE** DISTRIBUTOR

# MORSE

**MORSE TWIST DRILL & MACHINE CO.**
NEW BEDFORD, MASSACHUSETTS

A Division of VAN NORMAN INDUSTRIES, INC.
VN
4124

WAREHOUSES IN: NEW YORK • CHICAGO • DETROIT • DALLAS • SAN FRANCISCO

## Opens Treasury Doors

Russia's feat of putting a man in space before the U. S. may have opened the U. S. Treasury's coffers to NASA. Indications are that, instead of the $1.1 billion recommended by ex-President Eisenhower or the $1.24 billion proposed by President Kennedy, NASA may end up next year with something closer to $1.5 billion.

## Withstands High Heats

Pyrolytic graphite can now be used to permit a manned space vehicle to re-enter the earth's atmosphere without burning up from the heat of air friction, according to a GE space expert. Used on the spacecraft's nose and wing leading edges, it offers heat protection under conditions beyond the endurance of most materials. Pyrolytic graphite also shows great promise for general industrial and commercial use.

## Aids Ball Bearing Design

**A unique research tool, called a bearing simulator, checks ball bearing life in only one-tenth the time for a normal run-to-failure checkout. The device also gives quick, but comprehensive, evaluations of lubricants and contaminants, along with their effect on bearing life. The device has already been used in B-58 gyroscope studies.**

## Satellite Traffic Snarl?

With some 40 objects orbiting the earth already, scientists are foreseeing the need for a device to sweep dead satellites, rocket casings, and assorted man-made hardware into the atmospheric furnace where they would burn up. Some 1000 orbiting vehicles are expected in the next ten years. And radar engineers are already urging traffic monitors to coordinate space shots.

## Flexible Water Blanket

To protect man and equipment against the searing temperatures of space re-entry is a unique material developed by Astronautics Div. of Chance Vought. Composed of more than 50 pct water and with the handling traits of a solid, it's virtually a flexible blanket of water. In addition to space vehicle applications, the new material is expected to see service in fire-prevention walls, protective clothing, shipping containers for delicate instruments and in transport vehicles for cargo fire protection.

## To Probe Moon's Crust

**One of the world's most down-to-earth industries—the oil industry—may make an "out of this world" contribution to a science whose goal is the moon and beyond. Dr. E. R. van Driest of North American Aviation says that the oil industry's well-logging methods and instruments may be used on the moon within a few years.**

## Finned Tubes for Power

Finned aluminum tubes with excellent high-temperature properties are playing a key role in atomic-power development. Made from aluminum powder metallurgy alloys by the impact-extrusion process, they are being used by Atomics International for making nuclear-fuel elements as part of the AEC's program to develop low-cost nuclear power.

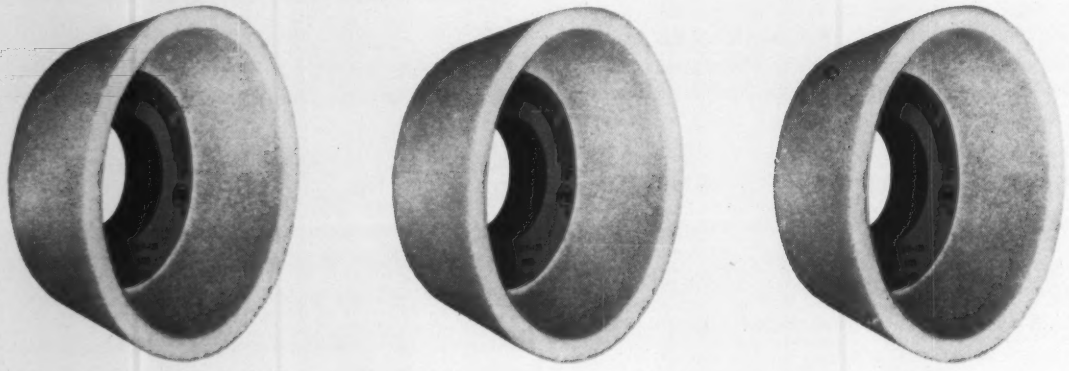
## Develop Space Science

**As programs for longer-duration space flights grow, look for space-life science to achieve greater importance. Design of space capsules or cabins of limited area, weight and close tolerances will require marriage of electronics, mechanical engineering, and medical and biological research. Space-life science could mean a whole new industry attuned to special needs of men in space.**

## Launchings From Sea

The government continues to consider sea launching pads for satellite and missile firings. The Navy plans to launch rockets from a ship or barge. Private firms suggest other methods. Aerojet-General Corp. proposes a sea base for assembling, testing and launching large rockets. Reasons for the sea-launch idea: To make launching sites mobile; to cut down launching hazards to populace; to pare costs of maintaining huge bases.

# POSITIVE DUPLICATION—EVERY TIME!



Music to please you is identically reproduced by these three hi-fi records pressed from the same master recording. The three toolroom grinding wheels (above) will also please you with their masterly Positive Duplication. That's because they are CINCINNATI (PD)* GRINDING WHEELS.

## FAMOUS, UNIQUE (PD) PROCESS

Unique in the industry, the famous Cincinnati (PD) manufacturing process is governed by 36 unvarying quality control steps. Print-weigh tickets, for example, must match the weights for every mix—*exactly* as specified on the Master Card which controls every operation in the rigid procedure.

## UNIFORM, PREDICTABLE PERFORMANCE

This extraordinary attention to manufacturing detail results in wheels of unsurpassed uniformity.

You can reorder CINCINNATI WHEELS with confidence, because they give you the same good job time after time after time. You use fewer (PD) wheels because they last longer.

## CALL CINCINNATI TODAY

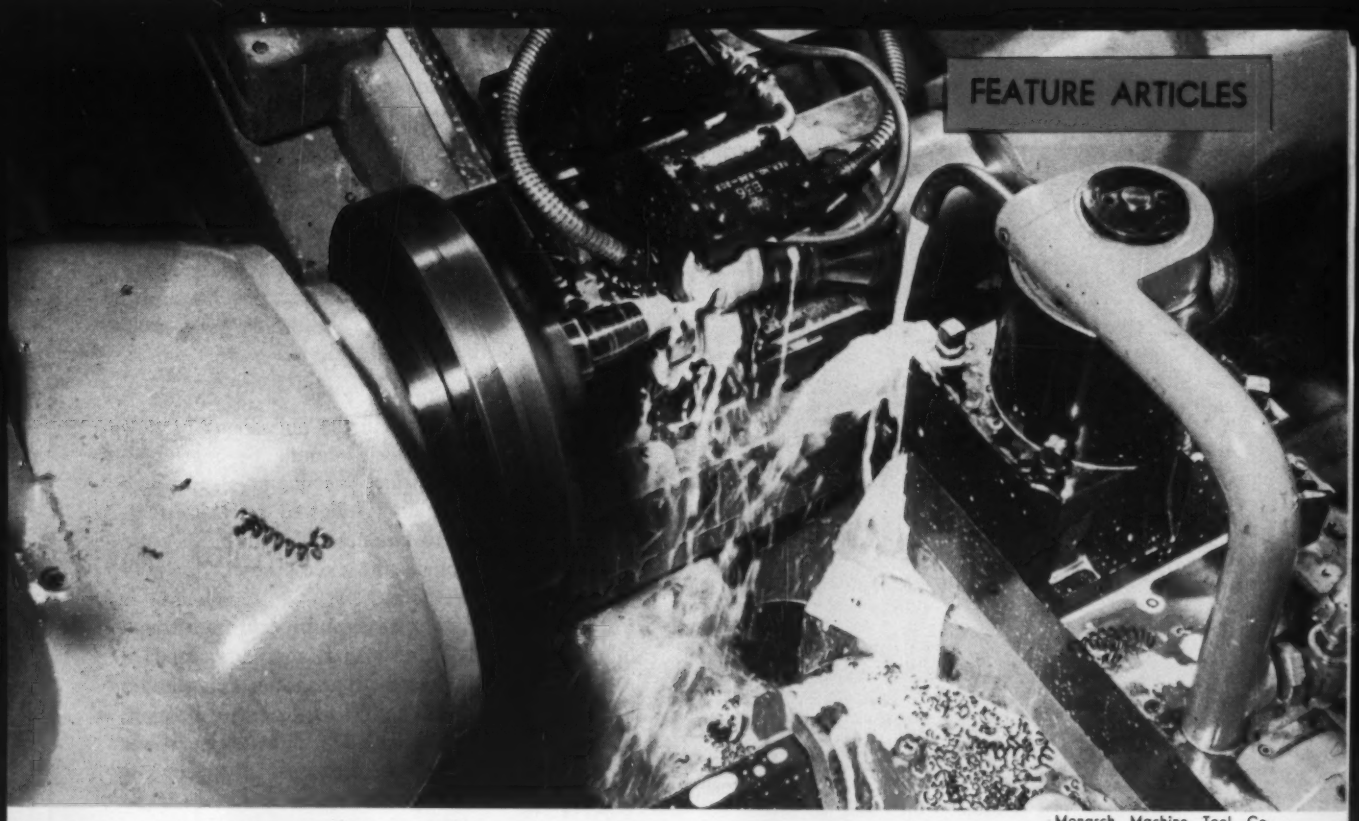
Factory trained by the Cincinnati Milling Machine Company, our grinding specialists are available to you for consultation on all your grinding problems. Call your CINCINNATI GRINDING WHEELS Distributor, or contact us direct, Cincinnati Milling Products Division, Cincinnati 9, Ohio.

(PD) POSITIVE DUPLICATION

CINCINNATI* GRINDING WHEELS

*Trade Mark Reg. U.S. Pat. Off.

A PRODUCTION-PROVED PRODUCT OF THE CINCINNATI MILLING MACHINE CO.



Monarch Machine Tool Co.

**THREAD ROLLING:** Heat-treated AISI 4145 steering knuckle (302 Bhn) is finished on tracer lathe.

# Fresh Approach in Machining Takes Aim on Hard Steels

**Most steels are machinable, but cutting requirements get more stringent as you start moving up the hardness scale.**

**For success, attention must focus on minute details.**

By **R. H. Eshelman**
Machinery Editor

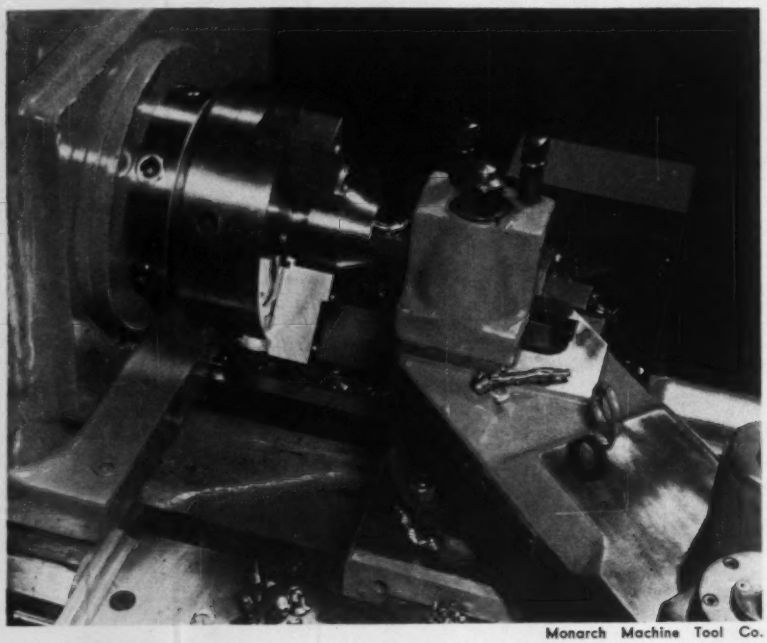
■ Steels that are harder than 300 Bhn are growing in demand. Parts machined from these steels are needed in missiles, for aircraft and by the nuclear industry. A trend is even underway among commercial users to include a greater number of machined, hard steel parts into their scheme of design.

These steels are machinable. Gears are being hobbed. Tool and die shops have been milling, drilling, boring and turning many hard alloys. To be successful, however, you must be more precise in your approach. Suit the proper techniques for the job at hand. Then make certain that the procedures are applied.

Take a word of warning from Michael Field, president of Metcut Research Associates, Inc., Cincinnati. Dr. Field points out that there's

## HIGHLIGHTS OF TOOL ENGINEERS' SHOW

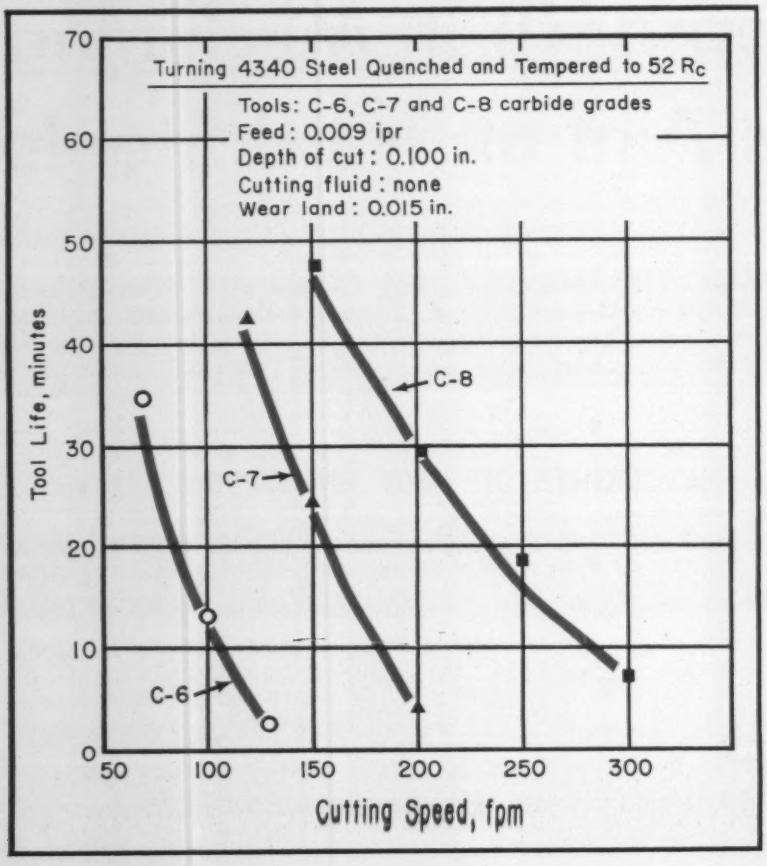
New York will be the site for this year's Tool Engineers' Show. Major features of the program can be found on Page 150. A complete list of the technical sessions starts on the same page. Turn to Page 136 for Show Previews and to Page 155 for an up-to-date, alphabetical list of exhibitors.



Monarch Machine Tool Co.

**HYDRAULIC BOWL:** A special tool and air tracer are used to bore the ID of hydraulic bowl part of 17-7 stainless. Alloy is 360 Bhn.

## How Grades of Carbide Differ




little leeway for variation when you're machining materials that approach the hardness of the tool.

All the factors are important, he adds, in materials' regions above 300 Bhn. But once you get above 508 Bhn (52 Rc), many of them become critical.

**Growing Trend** — A change is going on in the philosophy of how these steels should be machined. The former practice involved rough machining followed by heat treating to hardness. Then a finish grind brought the excess stock down to tolerance.

In the new approach, both rough and finish machining are done in the high-hardness state. This method is gaining in use; it's felt to be more economical. It eliminates problems met from heat-treat distortion. It also saves multiple setups, handling and production time.

It's vital that exact controls are maintained over such factors as choice of tools, geometry, feeds, speeds and cutting fluids. If you overlook these areas, tool life is likely to be very close to zero.

**Special Tools** — Very often, tool recommendations are for special grades or types. Just because these tools are not stock items, don't try to get by with a standard tool from the crib. This could result in disaster as well as poor economy.

The same thing can be said about many of the older machines. They might not be equipped with the complete variable range of speeds and feeds required to do the job. Of course, you might be able to update your present equipment.

Grain size and microstructure establish the ease of machinability of your hard metal. For that reason, each steel is governed by its own set of recommendations. The Air Force machinability reports contain a wealth of these data.

**Trouble Spot** — Design of the workpiece is another vital factor. Milling pockets, undercuts and other operations that require thin, delicate tools will just spell trouble. Get together with the design engineer

and explore a better way to make the part. It might be two parts which are welded together.

In any event, avoid machining cuts that impose impossible conditions. On the harder steels, stick with simple contours, facing or simple boring and turning steps. Watch out for tapping, slotting, deep small-diameter holes and severe interrupted cuts.

The harder the steel, the more brittle the chip. This leads to chatter, heavier cutting loads and frequent tool breakage.

**Metallic Trio** — There are three basic areas to consider when you're talking hard metals. One that the metallurgist looks at right away is the group of high-strength, abrasive tool-and-die steels that is coming into vogue for aircraft and missile parts.

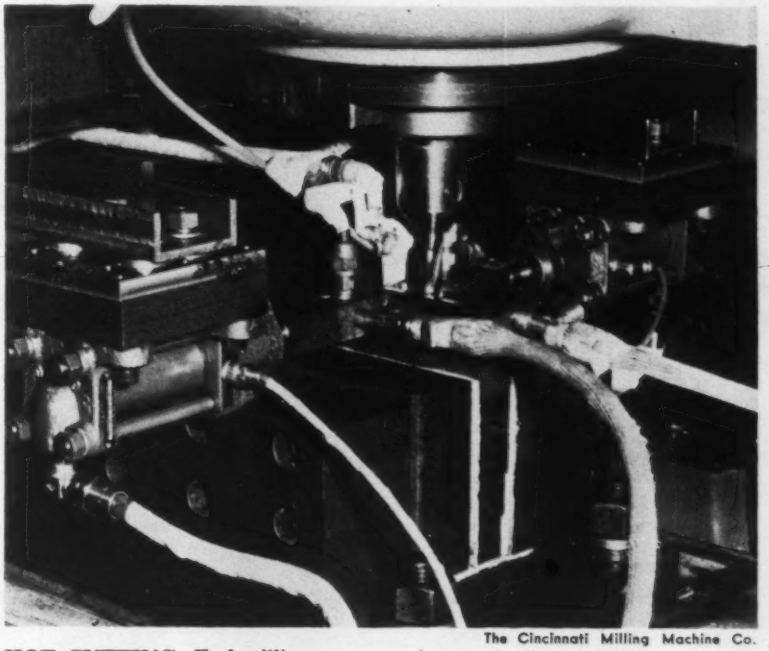
A second group is the stainless types. These alloys are getting a bigger play. Sometimes they have to be cut while they're in the heat-treated condition.

The third area is a little closer to home. It includes such alloys as 4340 and the more common types of machine steels. They come into the shop in the heat-treated condition. Then they're put on the lathe for final finishing. The newer tool materials and machines eliminate most problems in shaping this class of metals.

**Results of Program**—More shops are facing the problems of machining hard steels every day. Typical is a cost reduction program in an Iowa company, based on turning the OD's of carrier sprockets for cast-steel armor plate. Hardness varied from 255 to 320 Bhn.

Test results show that throw-away carbide inserts can handle such operations very well. Here are a few cutting conditions developed in the tests: cutting speed, 220 sfpm; feed rate, 0.011 ipr; depth of cut, ¼ in.; and average machining time, 5 minutes.

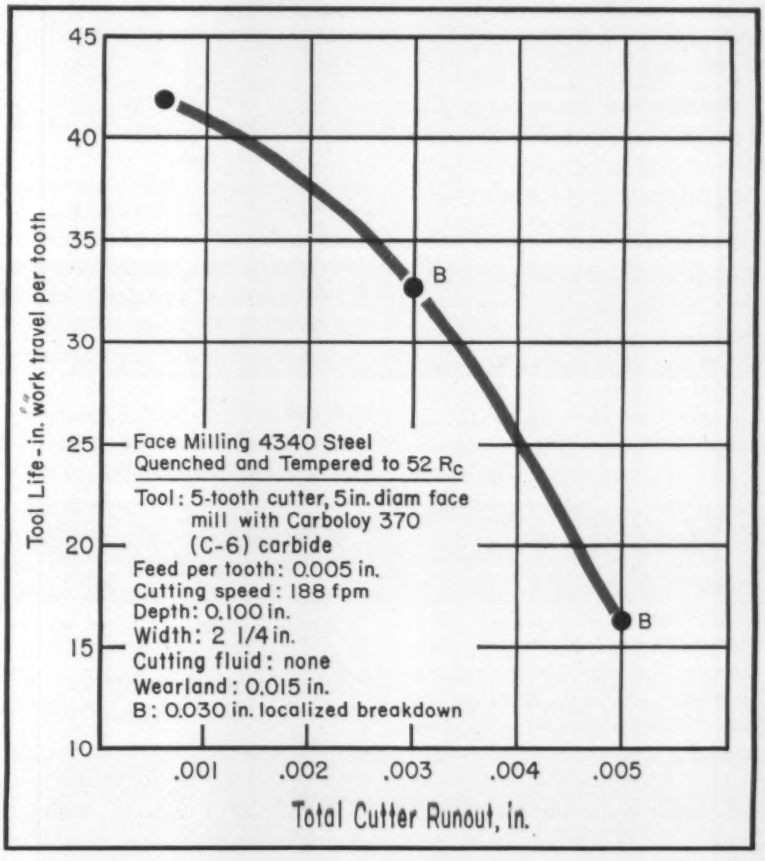
A plentiful flow of soluble-oil coolant surrounded each cut. Best results were achieved with a specially-designed holder and heavy rough-

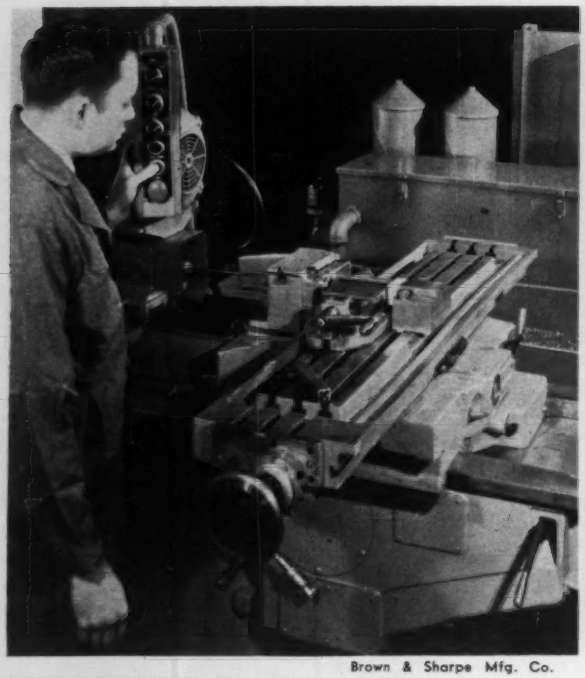


The Cincinnati Milling Machine Co.

**HOT CUTTING:** End-milling setup on hot-work die steel heats only the local cutting zone. Cutting is fast and tool life is extended.

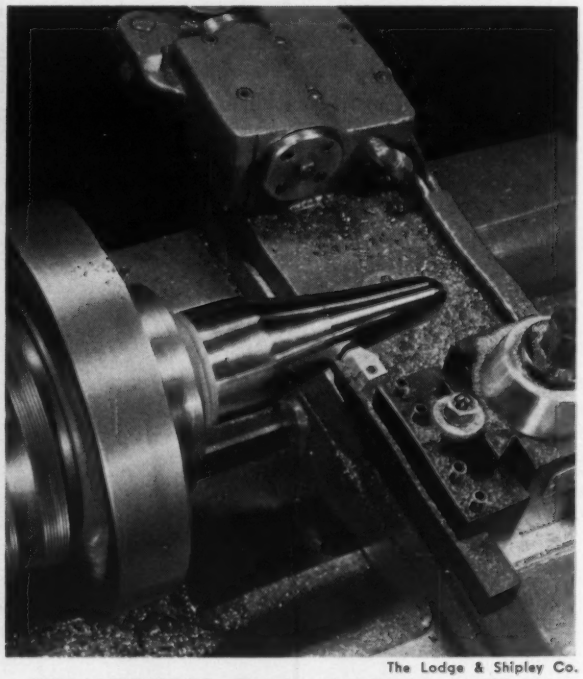
## Runout Affects Cutter Life





Brown & Sharpe Mfg. Co.

**DEEP DRILLING:** Single-flute tool with solid carbide tip is used in gun drilling chrome steel.



The Lodge & Shipley Co.

**CERAMIC TOOL:** Cast-iron bottle plunger (50 Rc) is machined by ceramic cutting tool on tracer lathe.

ing-grade carbide tool. This combination not only gave 42 parts per insert but dropped tool cost to about 4¢ per sprocket.

**Turning and Boring** — A West Coast manufacturer of aircraft landing gear performs turning and boring on heat-treated steel alloys such as 4340 on a regular basis. These parts are in hardness conditions of 450 to 570 Bhn. Shop workers hold the parts rigidly, give the tool a solid backup and use adequately-powered, sturdy machines.

This company reports an average cut with carbide tool as follows: speed, 250 sfpm; depth of cut, 0.060 in.; and feed, 0.008-0.010 ipr. Finishes of 125 rms are turned out consistently.

Deep bores are possible with profile blade controlled, using steel-jacketed solid-carbide-core boring bars. This type of bar is needed when an internal contour must be generated to a depth of 30 in. The bar is also required if support devices can't be used.

**Production vs. Lab**—Production lines have machined steels with strengths of 295,000 psi (Rc 56). In the lab, steels as strong as 350,000 psi (Rc 65) have been machined.

The situation changes once you get into interrupted cuts, odd shapes or eccentric masses. Here, you'll probably have to use high-speed steel tools. Also, it's best that you drop your cutting speed to about 30 fpm. Feeds should be in the 0.006-0.010 ipr range; cut depths should be between 0.015 and 0.030 in.

If you can, move into the harder carbides, like C-6, C-7 and C-8. Tool life tests show that the harder, more abrasion-resistant grades of carbide permit higher cutting speeds.

**Trial and Error**—It might pay to do some experimenting with different setups before getting underway. Some experts are eyeing titanium carbide tools. A preliminary trial-and-error test could help you select the right tool for the job.

Feed is important, too. With steels like 4340 and other alloys above the 500 Bhn range, you get very short tool life once the feed exceeds 0.015 ipr. Also, tests point to localized tool wear on the nose as a frequent cause of early tool failure in turning these hardened steels.

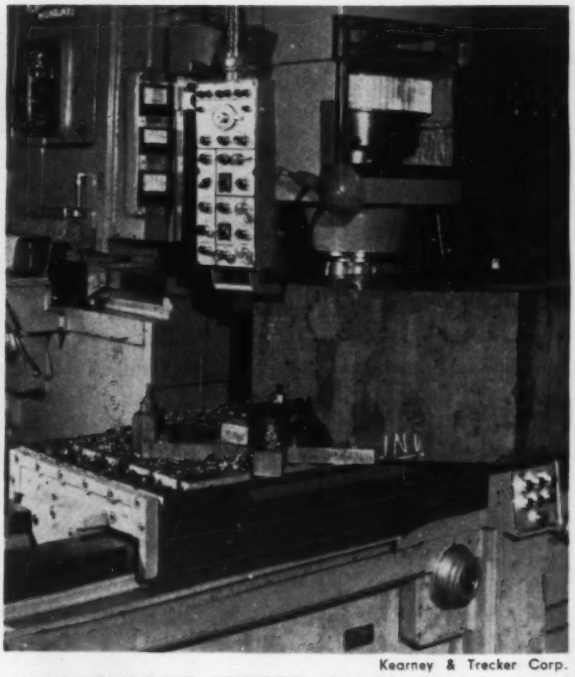
You can reduce this localized wear by increasing the side cutting edge angle. It approaches uniform wear at 45°. On steels above the 500 Bhn level, it's a good idea to work with a C-8 carbide tool. Its geometry should include negative 5° side and back rakes.

Both side and end cutting edge angles of 15° plus a relief of 5° are also advised. Thus equipped, you can safely take a cut of 0.100 in. with a cutting speed of 200 fpm and a feed of 0.009 ipr. Under these conditions, no cutting fluid would be required.

**Tool Choice**—What tools should you use on hot-working die steels? It depends on hardness. You can get about 30-minute tool life from C-6 grade carbides on the lower hardness range (up to 375 Bhn). You can even get tool life up to 60 minutes with high-speed steel tools, but you'll have to reduce cutting speeds to 45-60 fpm.

Monarch Machine Tool Co.

**PRODUCTION WORK:** Automatic tracer setup with carbide tooling turns out missile parts.



Kearney & Trecker Corp.

**MULTI-TOOTH CUTTER:** Die block of hardened steel (315 Bhn) is faced by 12-in. diam cutter.

Above the 500 Bhn level, C-8 carbide is recommended. It's also best to maintain a feed within the 0.007-0.009 ipr range if you're going to turn die steels harder than 52 Rc.

What tool geometry do you need to turn these steels? A side rake of 5° with a zero back rake gives good life for carbide tools. As long as the alloy isn't hardened above 52 Rc, a high-speed steel grade like T-15 can be used. It's also advisable to use a highly active, rather than soluble, cutting oil.

**Three Groups**—From the standpoint of machinability, stainless steels seem to fall into three groups: austenitic, martensitic and the precipitation-hardening types such as AM 350 and 17-7 PH.

Austenitic alloys are often harder to turn or bore than the martensitic steels. You can handle all of them best by using heavy, positive feeds. Include positive rake angles, too.

Cutting speeds for austenitic stainless should be kept to 150 fpm with carbide tools. Type 302, however, can be cut at twice that speed.

On martensitic steels, a highly sulphurized cutting oil allows a slightly higher speed. Both C-2 and C-6 carbide tools will do a good job of turning A-286, although C-2 is a good bet for an alloy such as Type 410.

**Ideally Suited** — Suppose you're machining AM 350. If you're going to use a C-2 tool, give it a positive rake angle; C-6 will do better with a negative rake. In the harder ranges, feeds up to 0.009 ipr are maximum for good tool life. Speeds should be held to 100-150 fpm.

Milling is good deal tougher than turning or boring. Shops experienced in milling hard metals voice a preference for carbide-insert indexable cutter blades. In milling across a lug face that contains a large hole, high-speed steel inserts like Type M7 may be used.

One promising method of milling these steels is by the hot machining technique. Research carried out at Cincinnati Milling Machine Co., under USAF sponsorship—Contract 33(600)40066—proves this method can be applied in milling parts of high hardness.

**Local Heat** — Perhaps the most promising part of the study is the use of radio-frequency techniques to supply local heating. Very favorable results have been gained by applying this system in face milling 17-4 Mo stainless at 380 Bhn.

Compared with conventional machining, the hot method reaps a 100 pct gain in tool life. Temperature at the cut is 1000°F. Problems must still be overcome in tempering and distortion. Nevertheless, this technique is ready right now to handle roughing operations on high-strength steels, where conventional cutting is troublesome.

In milling any hard steel, rigidity through the tool must be emphasized. A solid or stiff workpiece is essential. Machines designed for heavy die work will provide the mass, ruggedness and heavy service features required.

**Face Milling**—Precision face milling an aircraft part of SAE 4340 steel (500 Bhn) on such a machine has been done successfully at a feed of 1 ipm and a cutting speed of 25 fpm. At this hardness, a 12-in. diam

high-speed cutter with 22 blades was used.

Other production jobs include straddle-milling pin bases of front-wheel spindles for autos in the 300 Bhn range. Also, spindle flanges of 5132 chrome-alloy steel have been faced. Cutting speeds for the two jobs were 325 and 400 fpm, respectively.

As a result, there's no problem in face milling medium-carbon alloy steels at levels under 400 Bhn. Problems are involved, however, in steels such as 4340 when quenched and tempered to 514 Bhn. Here, cutting speed becomes critical. So does the feed per tooth.

**Tool Life**—Tool life tests show an optimum feed of 0.005 in. per tooth and a life expectancy of 90 in. of travel per tooth in down milling. At half that feed, tool life drops to 20 in. Double the feed and the tool life is only 10 in.

Control is needed over many factors in milling the harder steels. Face-milling cutters have to be ground precisely to avoid runout. The number of teeth in the cutter is another important area.

A 5-in. diam, 5-tooth cutter outperformed a 10-tooth cutter in a face-milling test. The former never had more than one tooth engaged in the workpiece at any time, and it milled double the length of workpiece per tooth than the 10-tooth cutter. The metal was a 4340 steel in the 515 Bhn range.

**Geometry's Role** — The role of tool geometry was also emphasized in the same tests. In face milling the above steel, for instance, maximum life depended on several factors. One was a constant angle of inclination of zero degrees. Another factor was a combination of axial and radial rakes which produced a resultant rake of 10°-15° negative. Optimum angle of inclination was between 10° and 20°.

Further tests proved that a 6°-10° increase in peripheral clearance boosted tool life by about 25 pct. For production milling, an 8° clearance seems very practical. Higher clearances can pose added problems.

An optimum geometry also exists in side milling. Take the martensitic grades like 4340, for example. Cutter life will go up if you employ axial rake angles of 5° negative and radial rake angles of 10° negative. The harder these same metals, the more reason to switch to C-6 carbide tools.

**Watch the Speed** — Then again, inside milling the harder grades of martensitic steels you'll have to keep an eye on cutting speeds. The optimum speed seems to be 145 fpm. Get a little above or below that figure and your tool life is liable to drop off sharply. The single-tooth cutter will last longer than a multiple-tooth type.

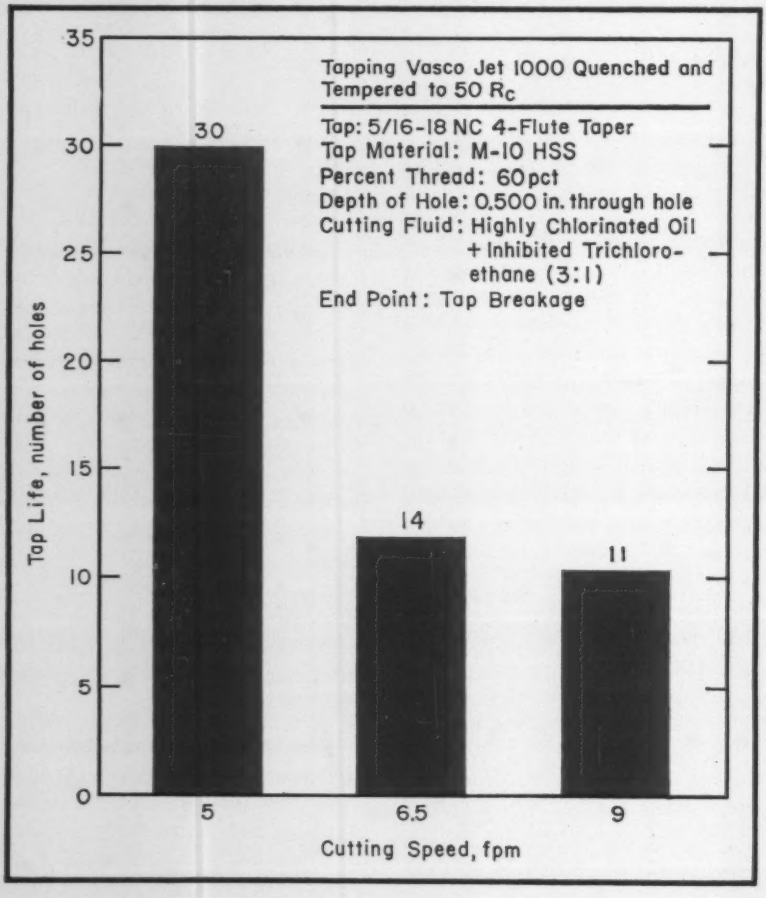
End milling and slotting can be real problems. High-speed steel tools are used in end mills. The cutters must be held rigidly. It's wise to keep the shank size the same as the cutting diameter. Cobalt-type or T-25 grade cutters are preferred.

Above the 52 Rc range, end milling becomes very delicate. Carbide tooling should be used along with light feeds. Cutting fluid might help prevent heat buildups in the cutter and in the workpiece.

**Down Milling**—In slotting, down milling will usually prevent tooth chipping. In the harder levels, the C-2 grade of carbide is often recommended. Look what happened when a single-tooth cutter was used on a Rc 52 hardened workpiece of 4340 steel. A feed of 0.005-0.0075 in. per tooth was possible with a depth of cut of 0.250 in.

Cutting speed was at its best at 200 fpm. By doubling the depth of cut, however, the cutter life dropped by more than 50 pct.

## Find the Ideal Cutting Speed



Two widely applied machining methods in harder steels are drilling and reaming. Nowadays, it's common practice to use both techniques on airframes, skins, and engine and landing gear parts in high-strength, thermal-resistant steels and alloys.

The main problem seems to be a lack of rigidity in the smaller size tools. This factor can be very troublesome.

**Tapping Troubles**—In the higher hardness levels, tapping also gets to be a problem. It even reaches the impossible stage in some materials. A change in design can offer a solution, though.

Experts on the subject point out that you can stay within practical limits. On 52 Rc material, for instance, aim for the lower tolerance limit during heat treat.

Here's another solution. The aircraft industry usually adheres to the figure of 75-80 pct as the percentage of thread in a tapped hole. Some tests have shown that a figure of 50-60 pct has little effect on design strength. Also, the use of a slightly larger hole can extend tool life, making the operation more practical for the shop.

One builder of aircraft parts, with experience in 4340 steel over a wide hardness range, suggests use of short drills. They'll offer better rigidity. The same company prefers cobalt grades of high-speed steel drills. Manganese rail-type drills are good, too. The engineers also suggest a positive feed (preferably mechanical).

**On the Beam**—Reaming presents no special problems. Carbide or high-speed steel tools (such as M-7) can be used. The M-7 tools should be used at speeds of 30 fpm and feeds of about 0.018 ipr.

Highly active cutting fluids afford advantages at the low cutting speeds on alloy stainless steels. On hard die steels with ¼-in. test drills, a highly sulphurized oil gives 100 pct boost in tool life over diluted soluble oils. Gain is from 13 holes to more than 30. Here, feed was 0.001 ipr and speed was 40 fpm.

Point angle of the drill is a factor, too. The harder the alloy, the greater the end thrust. The point angle should be held from 90°-118°. This will keep the end thrust in line and extend tool life.

There is a relationship between the speed and feed and the degree of workpiece hardness. If the cutting speed is too high, the drill tends to overheat.

On the other hand, if the speed is too low, chip flow becomes poor. In both cases, the drill will overheat, then fail. If you have to employ light feeds to drill the harder metals, keep the feed at the 0.001 ipr level. Otherwise, drill life will decline.

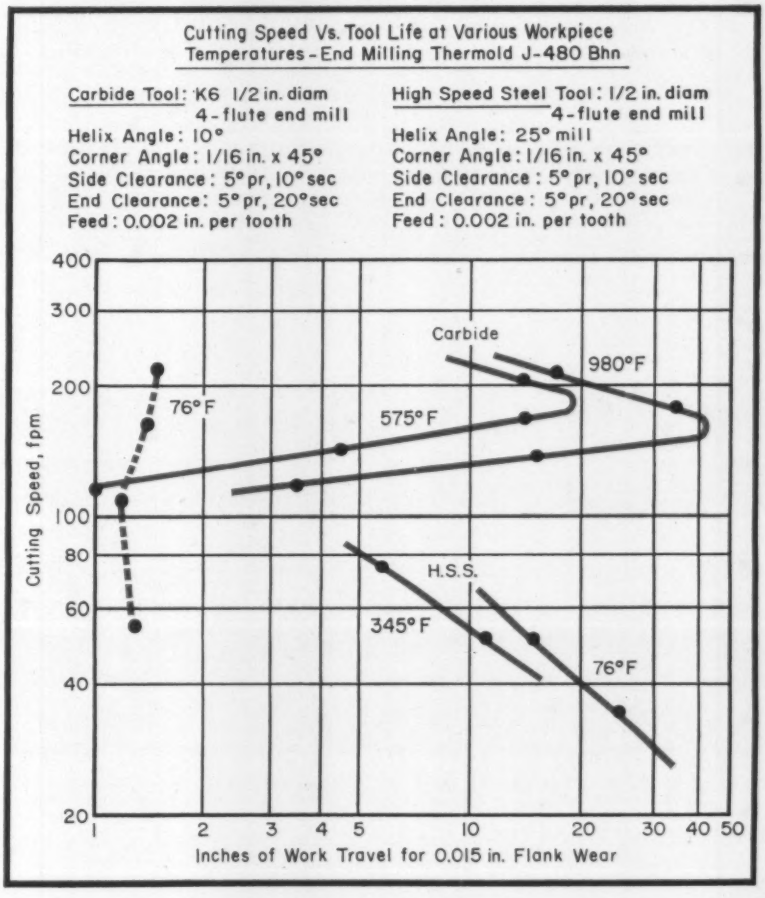
With the ¼-in. drill size, stainless types can be drilled at a feed of 0.005 ipr at 20-90 fpm. Speed will depend on the alloy and its hardness.

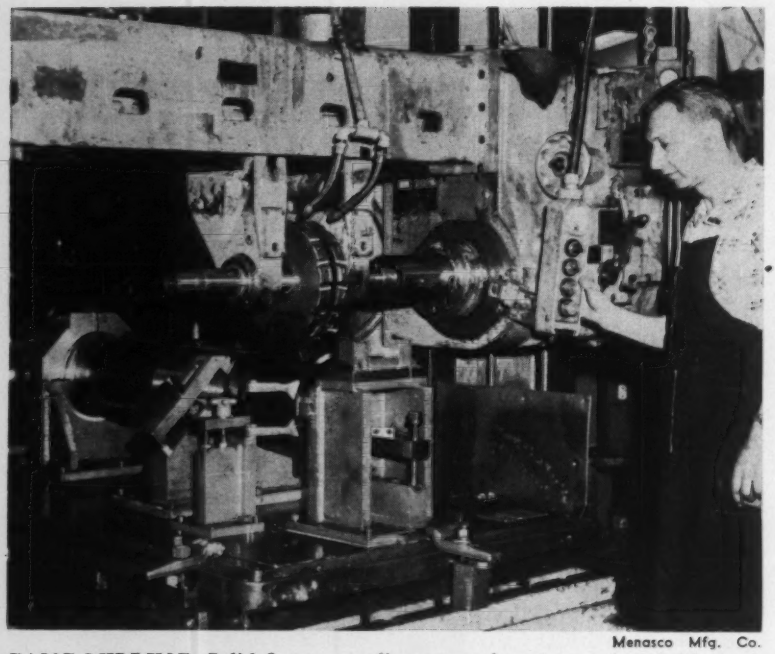
Once again, tests show that you can drill most of these hard steels right on up to 60 Rc. As soon as you pass the 52 Rc point, switch to gun drilling with either carbide or special hollow-shank drills.

**Gun Method** — Gun drilling is doing quite a job in machining deep holes in hard steels. Special machines are used. The drills are solid carbide tipped of the single-flute type. A special job was done on a part of prehardened 5-pct chromium steel of 390-432 Bhn.

Holes were parallel within 0.0003 in. over the 3 in. length. They were of excellent finish. It was done at 100 fpm with a feed of 0.001 ipr. A special fluid was also used. It contained high sulphur, chlorine and

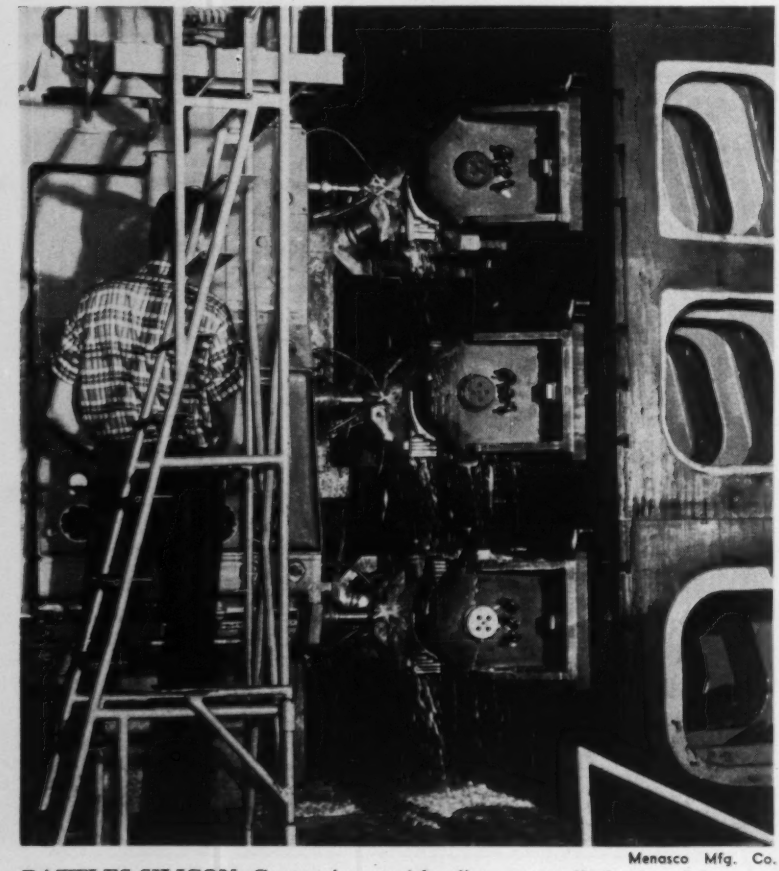
# Hot Milling Ups Tool Life





Menasco Mfg. Co.

**GANG MILLING:** Solid fixtures, well supported cutters and rock-like machine tools are needed to gang mill parts like landing gear struts.



Menasco Mfg. Co.

**BATTLES SILICON:** Contouring steel landing gear cylinder in triple setup owes success to heavy fluid flow to counter silicon content.

fatty oil and was fed through the drill at 600 psi pressure.

Careful control of cutting conditions in tapping is a must. On the very hard steels, cutting speeds have to be low. There are times when a speed of 5 fpm is required to secure a reasonable tap life on 50 Rc steel. An increase of just a few feet per minute can cause a drastic drop-off in tool life.

**Fluids at Work** — At these low speeds, active cutting fluids work out very well. A highly chlorinated oil, diluted 3 to 1 with inhibited trichlorethylene, will extend tap life handsomely on many of these steels.

In the harder ranges, surface treatment of the tap can be a great aid. Try a cyanide treatment for the alloy steels. Nitriding is recommended for the stainless grades. Light feeds are also desirable.

---

**Acknowledgments**—Many organizations cooperated in supplying information for this article. Special thanks are due the following: American Society of Tool and Manufacturing Engineers, Barber-Colman Co., Battelle Memorial Institute, Brown & Sharpe Mfg. Co., The Cincinnati Milling Machine Co., The Cleveland Twist Drill Co., Metallurgical Products Dept. of General Electric Co., Kearney & Trecker Corp., The R. K. LeBlond Machine Tool Co., The Lodge & Shipley Co., Menasco Mfg. Co., Metcut Research Associates, Inc., Monarch Machine Tool Co., National Twist Drill & Tool Co., Sunstrand Machine Tool Div., and Wesson Co. Acknowledgment is also given to the United States Air Force for submitting its AMC Technical Report, Contract AF33(600)-35967 AMC, Project 7-532. This project was directed by Curtiss-Wright Corp.

---

**Reprints** of this article are available as long as the supply lasts. Write Reader Service, The IRON AGE, Chestnut & 56th Sts., Philadelphia 39, Pa.

Ask for Reprint **No. 164**

# Quench Side Rails for Hardness

## Special Setup Leads Manganese Steel to New Uses

**Providing a quenching system that will obtain a metal's best properties usually saves money in the long run.**

**Researchers at A. O. Smith Corp. use special dies to meet lighter structural needs.**

■ Lighter side rail comes at a time when the transportation industry is engaged in an extensive weight reduction program to permit greater payloads at less cost.

A. O. Smith Corp.'s Automotive Products Div., Milwaukee, Wis., developed a new technique, along with the machines, to die quench side rails up to 40 ft long.

There's no loss in vehicular strength when lighter side members are used for trucks and trailers. The material's improved mechanical properties can handle the load.

Officials at A. O. Smith also see potential uses of the technique for structural members heading toward farm machinery, earth moving and allied equipment.

**Unique Design**—The quenching machine's unique design helps to straighten and pull the heat from a side rail in one operation. To do this, the side rail is taken from the furnace and rapidly placed into the quench machine. Here, it rests on knockout rods. The rods drop, lowering the rail into the quenching unit.

Next, a punch enters the rail and expands as the outer wall of the die contacts the side rail. Pressure increases to straighten the rail.

A water quench, circulated through the punch and die, flows through waffle-like faces against all sides of the rail at the same time.

The outer die wall then moves back and the punch rises. Knockout rods lift the quenched and straightened rail out of the machine while rear pushers slide it on transfer equipment.

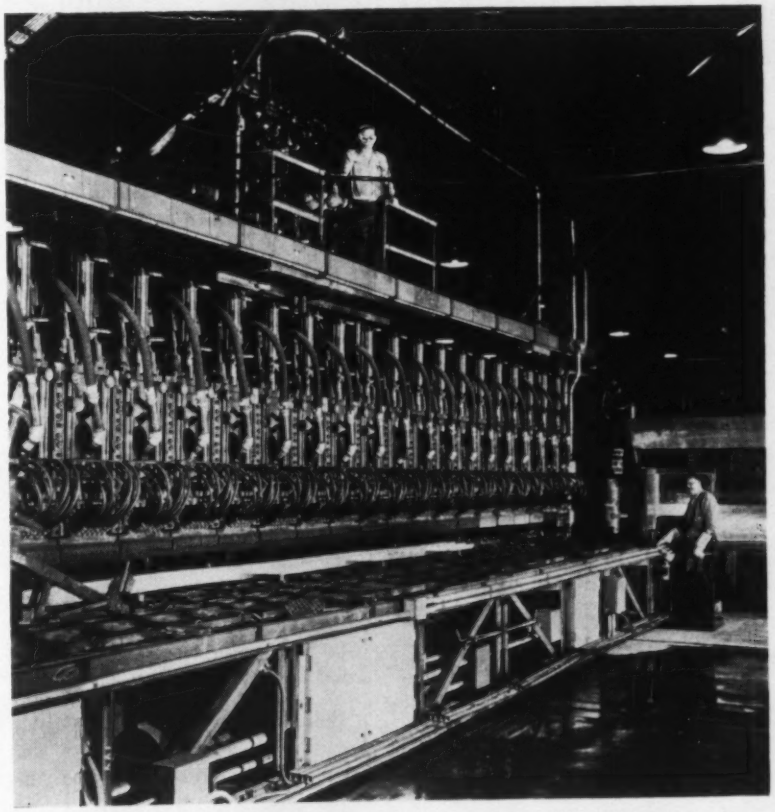
The operation compares with hot forming. Yet, it does not set up residual stresses in the rail. The locked-in stresses would cause the rail to distort upon release from the fixture.

**R & D Pays Off**—Extensive metallurgical research and testing programs went along hand-in-hand with the die quench process and machinery. This phase of the program assured the full development of hardness potential.

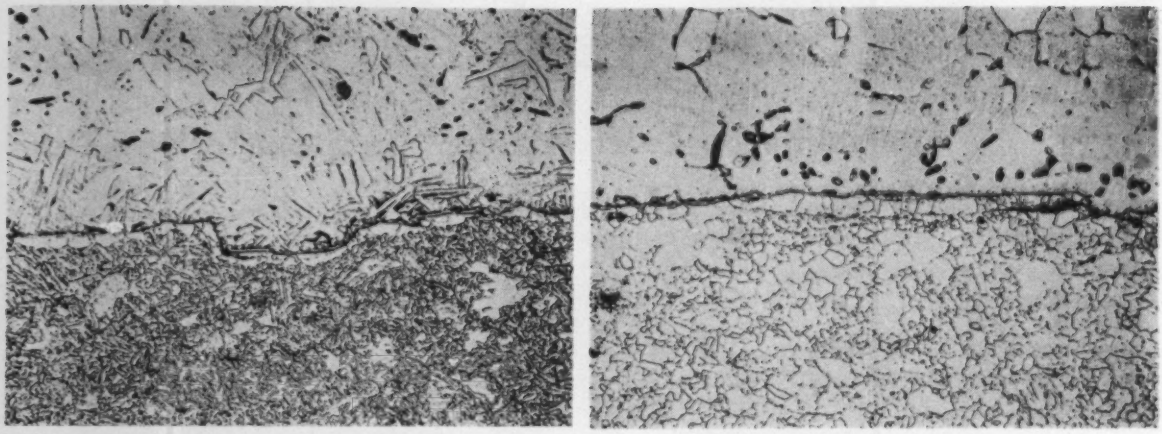
Researchers put intermediate manganese steel to work. The object being to obtain optimum properties from the manganese steel by providing the most potent quench possible.

A. O. Smith metallurgists likewise ran tests comparing the qualities of a richly alloyed and easily hardenable steel (SAE-8620) with the intermediate manganese alloy. Test results showed comparable engineering properties and metallographic structures in as-quenched and tempered specimens. The results set parameters for the production equipment.

The program results in the "marriage" of a versatile material with an advanced quenching technique.



**FIRM QUENCH:** As the dies lock against the hot side rail, water circulates internally. It flows through waffle-like faces making contact with the rail on all sides at the same time. This resembles hot-forming operations.



**MICROSTRUCTURE GIVES CLUE:** Hot-working of as-pressed titanium-clad steel (left) hardly affects the bond strength. The zone between the two reheated metals (right) is relatively free of brittle intermetallics.

# Argon Flush: Key to Fabrication Of Titanium-Clad Steel

**Added to the ever growing list of metal composites is titanium-clad steel plate.**

**Its formability and weld-ability suggest its use for a variety of jobs.**

By **C. L. Kobrin**
Metallurgical Editor

■ Titanium-clad steel plate, though not yet a standard production item, is bidding for commercial acceptance. The first large order from Lukens Steel Co., Coatesville, Pa., is slated for delivery within a few weeks.

The purchaser: E. I. du Pont de Nemours & Co. The order calls for: one plate, 204 x 64½ x ⅝ in. of 22 pct titanium on A-204 backing steel; one head, 66¼ in. ID of the same material. The clad steel will be used for a reactor.

According to Joseph Proctor, manager of market development, Lukens is taking orders on a development basis. However, in general, plates are available in 1¼-in. total gage with cladding up to 3/16 in. Width is 4-8 ft; plate-length to width ratio is 3:1.

**Why Clad With Titanium?**—Key to titanium-clad's future is its teaming of low-cost corrosion resistance and formability. Reactors, pressure vessels, and tanks for the process, chemical and petroleum industries are some of the shapes into which it can be formed.

Many of these vessels might normally be of solid titanium or stainless steel. Some fabricators use a composite of steel and titanium that is not metallurgically bonded.

Titanium can be clad to a variety of steels. But Lukens finds that with many of the steels subsequent hot working tends to break down the bond.

**Foil Inserts Costly** — Inserting vanadium or silver foil between the titanium and steel is not the answer, says William Funk, Lukens research administrator. This trimetal composite takes hot working; bond strengths are good. However, the added processing and metal make this approach prohibitively costly.

If the backing is A-387 or a chrome-moly steel, the clad steel can be hot formed, stress relieved, or welded. Apparently, the chromium or molybdenum prevents the formation of brittle intermetallic compounds of titanium and iron.

**Use Stainless Technique**—Making titanium-clad steel plate is by the roll-bonding technique Lukens uses for stainless-clad steels.

Essentially, this method consists of making a four-deck sandwich of steel - titanium - titanium - steel. Welding steel strips to the sides of the sandwich totally encloses the composite.

Hot rolling of the sandwich metallurgically bonds the titanium to the steel. Parting compound, placed between the titanium slabs, allows separation of the sandwich after rolling into two clad plates.

**Protects With Argon**—Because titanium is so reactive, certain departures from standard roll-bonding

practice are musts.

Most important is purging and flushing the sandwich with argon during the 6-10 hour heating cycle before hot forming. Argon enters the sandwich via a flexible stainless steel tubing. The geometry of the sandwich permits easy passage of the argon between the metal layers.

Lest the titanium and iron interdiffuse to form brittle intermetallics, rolling temperature is below 1750°F. And, naturally, the surfaces of the titanium and steel must be kept extra clean.

**Check the Strengths**—Bonds produced by this technique are strong and ductile, says Mr. Funk. Shear strengths exceed the ASTM minimum requirement of 20,000 psi for stainless-clad steels have been produced. In most samples, the table shows, reheating at 1400°F hardly affects the bond strengths.

Many fabricators are hesitant to weld heavy gages of titanium, adds Mr. Funk. This points up another advantage of the clad steel.

Simple butt welding of the steel backing side—stopping before the titanium is reached—is one technique. If a gap between the two abutting edges is unacceptable, a titanium strip can be welded over it. Welding thin sections of titanium is much less troublesome than welding heavy plate gages, explains Mr. Funk.

Other welding techniques which use vanadium or silver as interliners can be improvised.

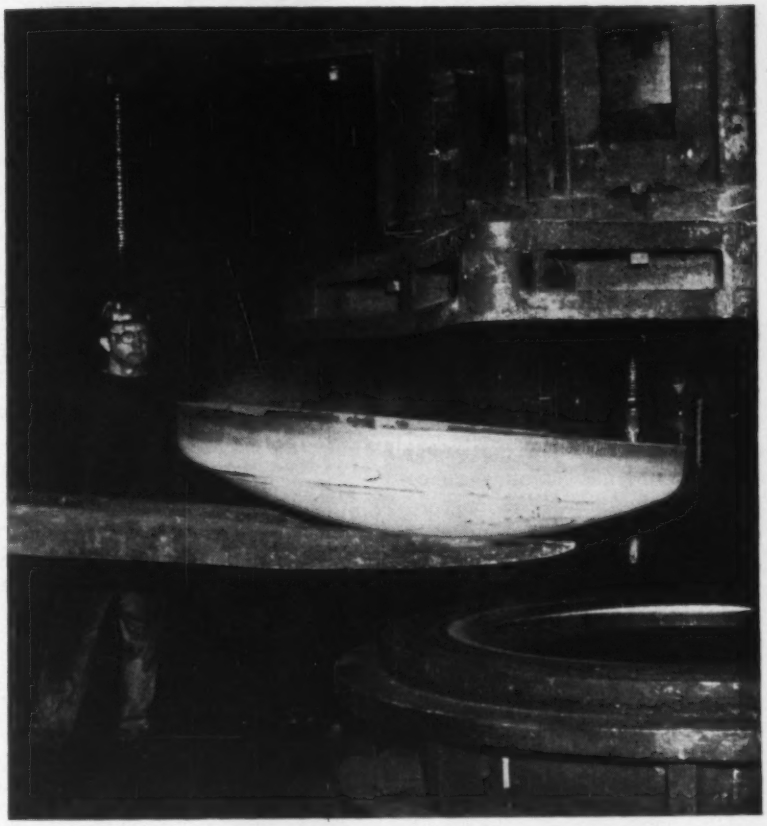
**Tips for Forming**—For fabricating titanium-clad steel plate, Lukens offers these tips.

Drawing is best done hot—but not higher than 1600°F.

Cylinders can be made by cold forming. However, heating to 300-400°F avoids a springback problem.

Keep the bend radius within three times the thickness. This is the only caution other than careful edge preparation when cold bending.

For cutting plates, machining is recommended over gas or arc cutting. Shearing should be avoided.



**DISHED HEAD:** Titanium-clad steel can be hot formed into a number of shapes. This dished and flanged head is for a process reactor.

## Clad-Steel Strengths Hold Up

| Backing Steel | Bonding Pressure, psi | Shear Strengths, psi | |
|---|---|---|---|
| | | As Produced | After Reheating |
| A-302 | 100,000 | 31,950 | 10,850 |
| A-302 | 50,000 | 30,000 | 25,350 |
| A-202 | 150,000 | 32,500 | 29,500 |
| A-204 | 150,000 | 44,800 | 39,900 |
| A-387D | 150,000 | 31,900 | — |
| A-387D | 100,000 | 26,900 | 27,000 |
| A-387D | 50,000 | 28,700 | 31,000 |
| A-387D | 100,000 | 31,200 | 29,250 |
| A-387D | 100,000 | 24,000 | 40,050 |
| A-387D | 100,000 | 23,500 | 29,300 |

Reheating: 1400° F, 2 hours, air cool.

# Tape-Controlled Mill Checked Quickly With New Recorder

**Why chance costly downtime on expensive tape-controlled units?**

**Here's an instrument that checks machine response quickly.**

■ Tape-controlled machine tools, like any fine mechanism, need occasional adjusting on the long production run.

Direct-writing records quickly check a machine's control system and report on its responses.

Rocket engine producer, Aerojet-General Corp., Sacramento, Calif., tests its tape-controlled milling machine once a month. Here, the direct-writing recorder insures that accurate servo response and proper control signals are present on the big mill's magnetic tape.

The preventative maintenance check takes less than two hours. Thus, tests can be run during a normal shutdown period.

**Tests Tape**—Three types of tests are made on the machine and control tape using a Brush Instruments Mark II recorder for readout. Its special tape checks the control system's servo response. Sudden velocity changes are fitted in the test tape to best check the system's response.

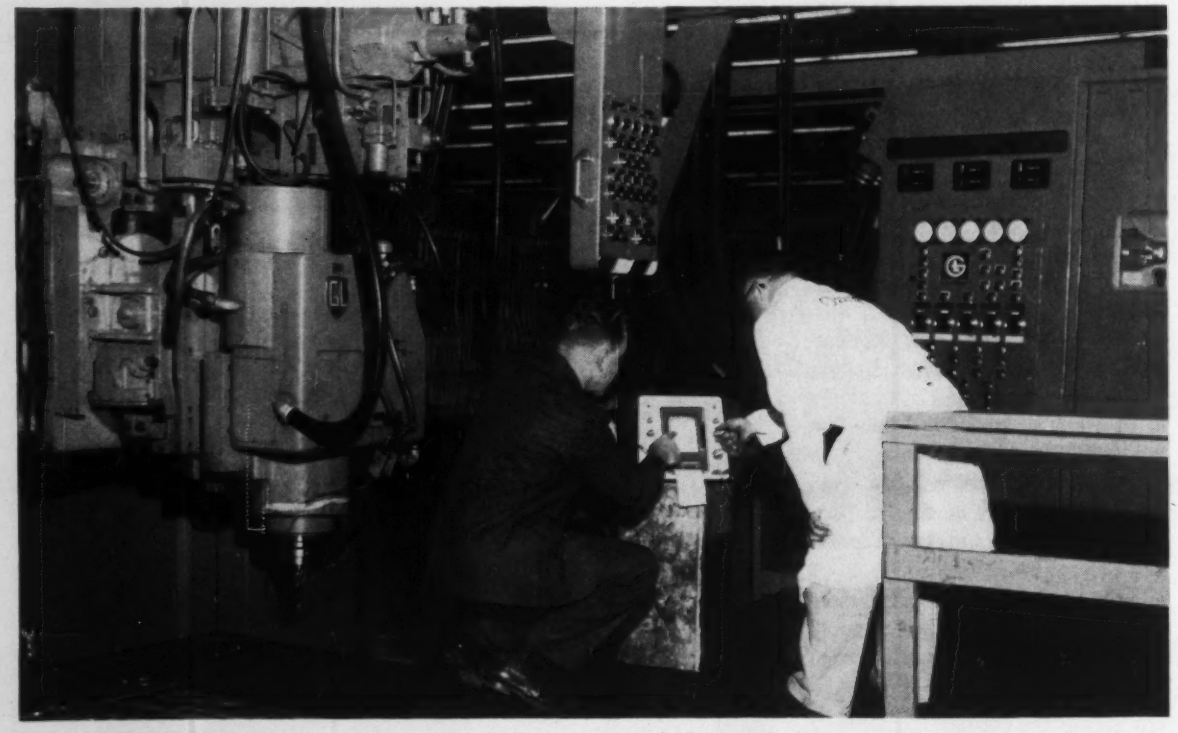
The test tape does not have acceleration or deceleration features since it's not intended for part cutting. However, recordings check the amount of overshoot in response to step-velocity input to insure that it's neither too large nor too small.

Check points on the mill's servo system include table motion and head motion. The output signal from the test tape, along with the feedback signal from the synchro unit feed a discriminator panel.

The two signals are compared with respect to phase only. With signals exactly in phase, the discriminator output is zero. When signals are 90° out of phase, the output is about 30 v dc.

**Quick Check**—Table and cutting head movements both appear simultaneously as a dc output of the discriminator. They are recorded on the two adjacent channels of the recorder for comparison.

Production tapes for controlling



**TELLS THE STORY:** Monthly maintenance checks—made in short order—keep this milling machine's numerical controls in top condition. A recorder checks the machines response to a given command.

the milling machine may contain faults or experience a momentary loss of signal. Control signals for starting or stopping of motion may also be absent from the tape.

Either loss of signal or lack of acceleration or deceleration signals will cause the machine tool to stop

**Tests Acceleration**—Tape signals which control rapid changes in velocity may be excessive. Thus, the machines moving parts overshoot causing the system to "lose synchronism." A relay senses the overvoltage and stops the machine.

The faulty condition can be avoided by programming a gradual acceleration on the tape until the final velocity is reached. This includes getting to top speed and returning to a standstill condition.

The gradual acceleration program feature occasionally does not appear on the tape due to it's production errors. Where the feature doesn't exist, it may "appear" that there is a fault in the control system.

**Finds Fault** — To pinpoint the problem and make certain that the machine tool is functioning properly, the servometers are disconnected. Then, the two-channel recorder is connected to the output of the discriminator panel.

The output of the discriminator appears as a sawtooth wave. The wave's frequency is the difference between the motion and the reference frequency. Constant velocity requires a constant frequency, and the reference frequency always remains fixed at 200 cps. Thus, the saw-tooth frequency will remain constant unless gradual acceleration or deceleration is in the program.

The motion frequency gradually changes and the difference frequency will be variable when acceleration or deceleration is present.

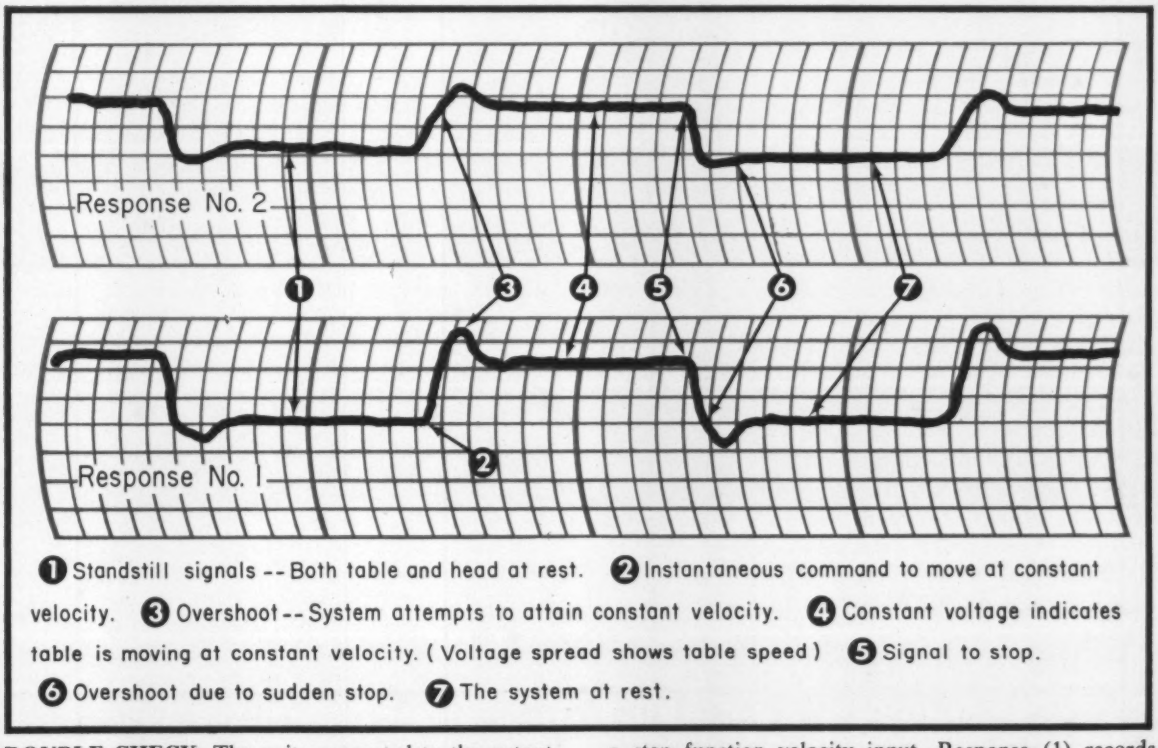
**Signal Dropout**—The Brush recorder is also used to determine whether or not a "drop out" or temporary loss of signal has occurred in the tape. If this happens, the machine stops. Checks made in the same manner as that used for determining stop and go on the magnetic tape solve the problem.

In this case, the recorder chart paper is run faster. If a drop out has occurred, it's seen on the sawtooth wave as a blip or spike voltage superimposed on the wave. This situation rarely occurs, but when it does, it's usually due to a small particle of foreign matter. It lodges between the tape and recording head.

**Signal Pickoff**—While the machine tool is in operation, signals can be picked from jacks provided on the control panel. Maintenance checks relate many minor errors. These too can be adjusted by studying the recorded error signal.

Weekly checks conducted on critical parts correct drift. This check is always made with a voltmeter-ammeter type instrument. An oscilloscope can check the waveforms if necessary.

# Check Mill's Table and Head Response




1 Standstill signals -- Both table and head at rest. 2 Instantaneous command to move at constant velocity. 3 Overshoot -- System attempts to attain constant velocity. 4 Constant voltage indicates table is moving at constant velocity. (Voltage spread shows table speed) 5 Signal to stop. 6 Overshoot due to sudden stop. 7 The system at rest.

**DOUBLE CHECK:** The unit, connected to the output of the discriminator, records the systems response to a step function velocity input. Response (1) records the table's response while (2) plots cutting motion.

# Roll-Weld Method Bonds Panels

## Corrugated-Core Panels Produced With Simple Tooling

**Corrugated-core panels may be headed for more applications.**

**Roll welding produces sound core-to-cover bonds without jigging. The welded panels also withstand severe forming.**

▪ Corrugated-core sandwich panels are normally thought of as high-cost goods. Why so? Because production methods usually call for expensive tooling.

Researchers at Battelle Memorial Inst., Columbus, Ohio, working under a program sponsored by Douglas Aircraft Co., say, "not any more." Their new roll-welding method requires no jigging, yet yields sound core-to-cover bonds.

Materials are hot-rolled to pressure weld the peaks of the corrugated metal core to the cover sheets. At present, rolling-mill capacity limits panel sizes to ¼ in. thick 36 by 72 in. sections. Materials already lending themselves to the process include: 2014 aluminum, B120 VCA titanium, pure titanium, steel, molybdenum and Inconel.

**Woven Sheet**—To form the corrugated core, an accordion-pleated sheet of metal is woven over and under V-shaped inserts such as copper and iron. The inserts must be chemically soluble and resist deformation.

A rectangular metal frame is placed around the core, and the face sheets of the sandwich are added. Two more metal cover sheets clamp the entire assembly in place after they're welded to the rectangular frame. The whole package is then hot rolled parallel to the corrugations.

In addition to welding the core to both covers, rolling also reduces the thickness of the panel up to 60 pct to provide the desired corrugated shapes. After rolling, the retaining frame is sawed or sheared and the metal outer covers peeled away.

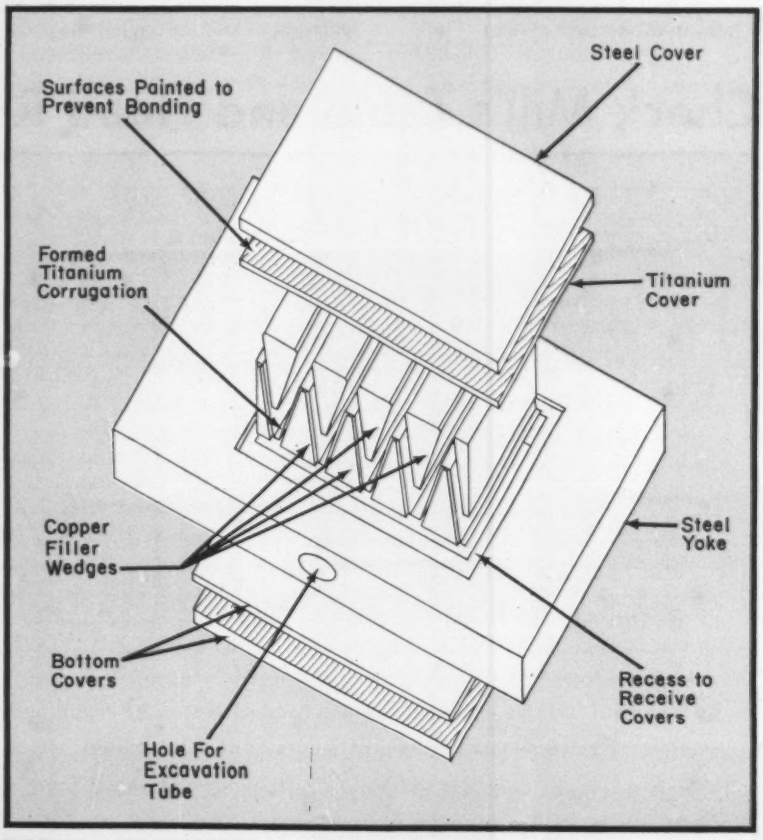
With the support wedges still in place, the sandwich panel can be formed into a wide variety of shapes, including hemispheres, without buckling the core. Standard tooling can be used, working the panel as though it were a solid metal plate of equal thickness.

**Chemical Leach**—A chemical reagent, such as nitric acid, leaches the V-shaped inserts from the panel's core. Although the leaching process requires several days for very large panels, it's a simple operation, plus the fact that cost is low. If necessary, leaching can be accelerated by mechanical means.

Since filler-wedge design determines core design, roll-welding can also be used to produce vertically-ribbed cores. The only limitation is that the core must be unidirectional.

Roll-welded corrugated sandwich panels approach the all-round rigidity of honeycomb sandwiches. Yet, the new panels are easy to make.

## Hot-Rolled Pack Yields Panel




**FORMS AND FIXTURES:** The pack assembly holds the corrugated-core elements in place. After rolling, the frame is cut and the protective covers peeled away. The panel is then ready for extensive forming.

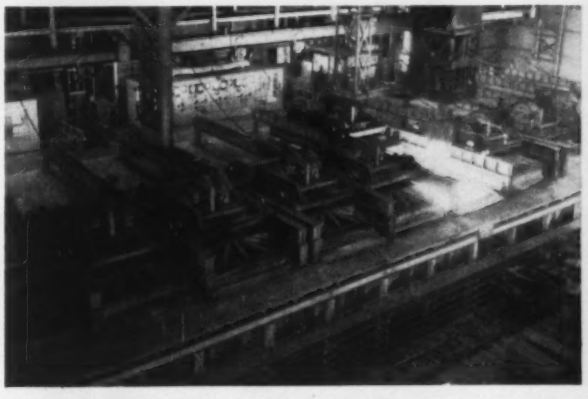
Salem-Brosius soaking pits at Inland Steel Co.

# High production and low costs attract steel mill operators to Salem-Brosius soaking pits

All over the Free World — in United States, South America, Europe, Australia, South Africa, Japan and wherever steel is made — steel plant operators are specifying Salem-Brosius soaking pit furnaces. Salem-Brosius furnaces, with their rapid and uniform heating, easy operation, production economies, low maintenance cost, long life, and reduced metal loss, are helping these operators increase output, reduce cost, or both. There is quality in design, engineering, and construction of Salem-Brosius soaking pit furnaces.

A leader in the field of industrial furnace design and construction, Salem-Brosius, with its world-wide organization, is ready and able to help you solve any heating and heat treating problem. When you purchase Salem-Brosius furnaces, you are assuring yourself of maximum uniform production at minimum operating and maintenance costs. If your plans call for any type of metal heating or heat treating furnace, it will pay you now and for years to come to specify your furnaces to be built by Salem-Brosius.

Lukens Steel Co.'s battery of Salem-Brosius pits.



Soaking Pits by Salem-Brosius at Acme Steel Co.

# Salem-Brosius, Inc.

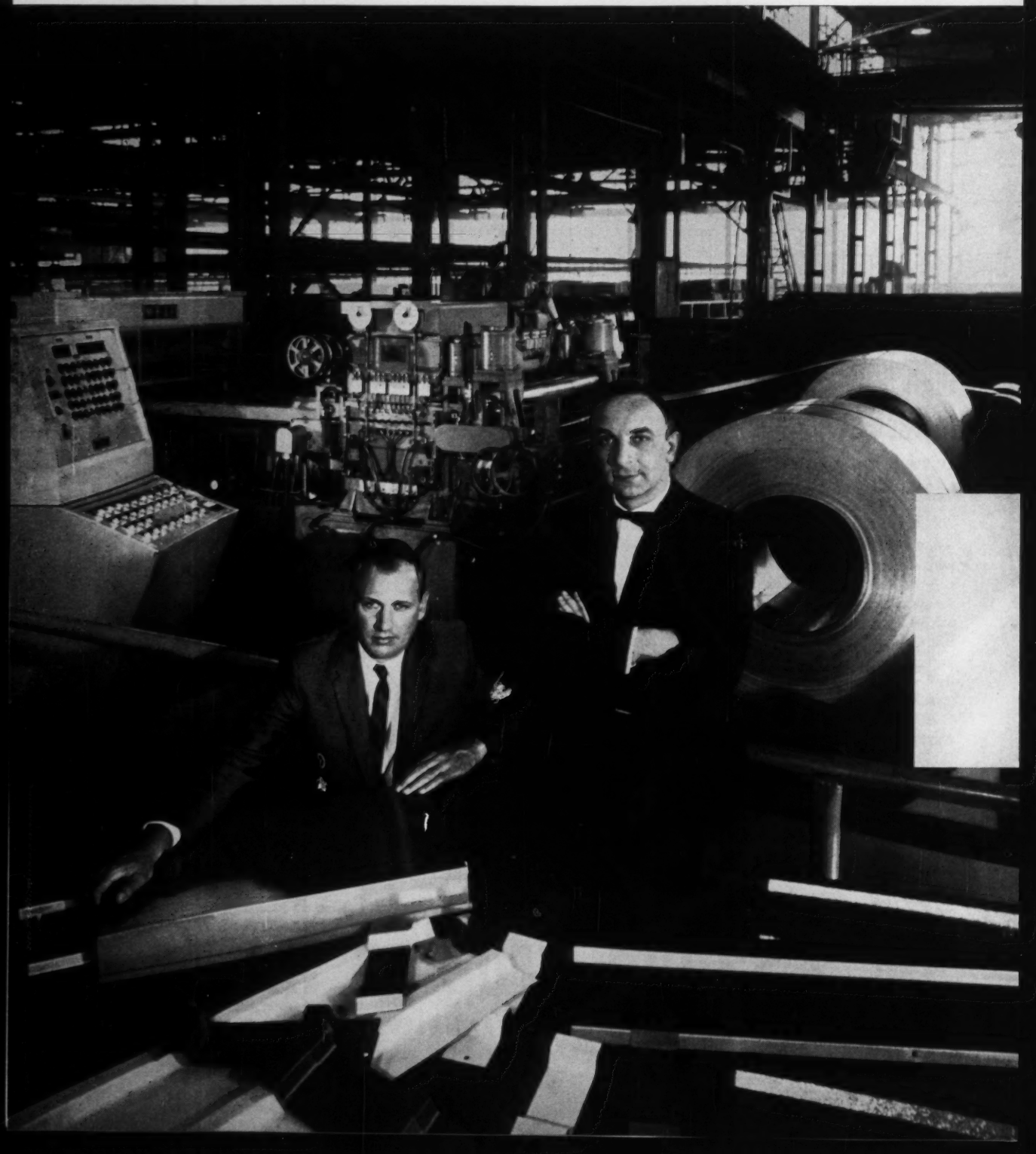
**PITTSBURGH, PENNSYLVANIA**

In U.S.A., South America, and Mexico—Salem-Brosius, Inc., Pittsburgh • In Canada—Salem-Brosius (Canada) Ltd., Rexdale, Ontario • In England—Salem-Brosius (England) Ltd., London and Milford, England • In Continental Europe—Salem-Brosius (France) S.A., Paris, and Ugnsbolaget, Svenska Metallverkens, Vasteras, Sweden • In Africa—Salem-Brosius, Inc., Pittsburgh; and Salem-Brosius (England) Ltd., London and Milford, England • In Australia—Head Wrightson (Australia) Pty. Ltd., Sydney, N.S.W. • In Japan and India—Daido Steel Co., Tokyo, Japan

**McKAY DIE SHEAR LINES CUT MORE THAN STEEL.** The most economical and efficient shear lines in operation today, they are being used by dozens of leading metal producers, fabricators and warehouses to slash shearing costs. Here, McKay Sales Manager Joseph F. Lyden, Jr., and M. G. Slaney, Building Division Manager, The Parkersburg (W. Va.) Rig and Reel Company — one of the nation's fastest growing manufacturers of pre-engineered metal buildings — examine panel sections cut to length by the high speed McKay Die Shear Line in the background.

# This is McKay

Photo by Arnold Newman



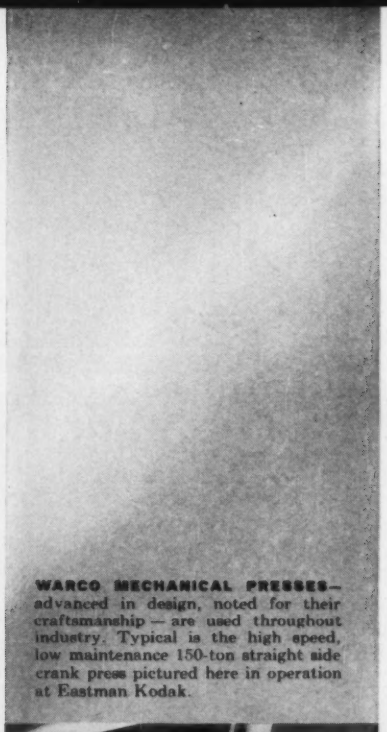
# Machine....

*a recognized leader in the development and manufacture of high production metal processing equipment!*

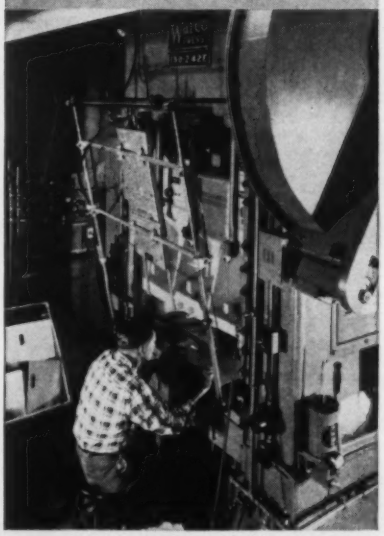
If you fabricate metals and are caught in the "profit squeeze" you'll want to know more about McKay Machine.

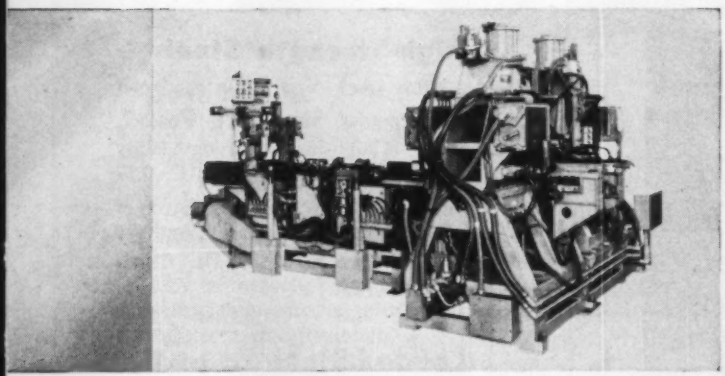
It was McKay Machine that pioneered automated integrated production lines, and it is McKay Machine that is today a leader in this field. We have conceived and produced complete lines for the manufacture of building panels, aircraft and missile sections, appliances, cabinets and components, automotive bodies and parts, and farm equipment—lines that are completely automated from *raw material to finished part or product.*

Whatever you make, if it requires metal handling, feeding, slitting, shearing, stamping, welding or forming, it's just good business to acquaint yourself with *McKay Packaged Production Lines*—high speed production equipment engineered to work in unison—with one-source responsibility from start to finish. Write for literature to *The McKay Machine Company, Youngstown 1, Ohio.*



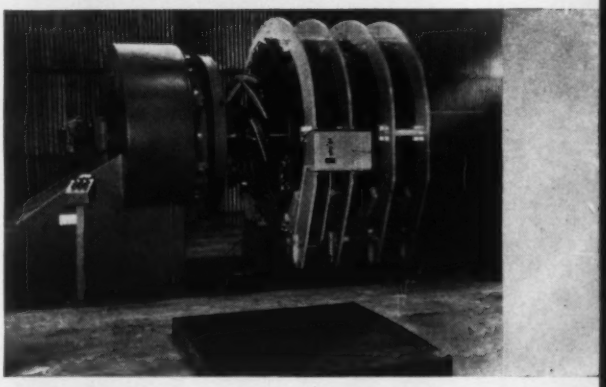
**WARCO MECHANICAL PRESSES**—advanced in design, noted for their craftsmanship — are used throughout industry. Typical is the high speed, low maintenance 150-ton straight side crank press pictured here in operation at Eastman Kodak.





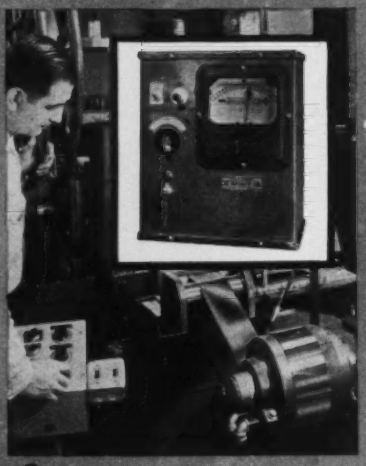
**FEDERAL RESISTANCE WELDERS AND WELDING LINES,** like this multi-gun combination spot and projection welder used by Hotpoint on their range production line, can be found in the plants of leading metalworking firms the nation over. Individual units, or complete resistance welding lines, are engineered to specifications by McKay's Federal-Warco Division.

LOOK TO McKAY MACHINE



**BERKELEY-DAVIS AUTOMATIC ARC WELDING MACHINERY** produced by Berkeley-Davis, Inc., a subsidiary, is highly popular in the aircraft, rocket, automotive and appliance industries. The rocket body welder pictured here is working at Aerojet General, subsidiary of General Tire and Rubber Company.

# CONTEMPLATE SOMERS THIN STRIP FIRST



Somers provides the most durable, dependable material for a wide range of electronic, electrical, aircraft, missile and many other applications.

For accuracy in dimension, physical and chemical properties on metal from .010" to .000125 thin (nickel alloys from .020"), consult Somers — over 50 years the number one source.

| | |
|---|---|
| Brass | Stainless Steel |
| Copper | Phosphor Bronze |
| Nickel | High Temperature Metals |
| Monel | Beryllium Copper |
| Inconel | Glass Sealing Alloy |
| Inconel X | Tin Coated Metals |
| Nickel Silver | and Rare Metals |

Write for confidential analysis of your specific requirements — no obligation, of course.

Somers THIN STRIP

THE SOMERS BRASS CO., INC., WATERBURY, CONN.

Phone (Area Code — 203) PLaza 4-8321 TWX-WBY77


## NEW PATENTS

### Iron-Ore Treatment

**Iron-ore treatment method, Y. Nogiwa, Feb. 28, 1961.** To smelt hematite, magnetite and other iron oxides, the ore is suspended in hot, reducing-gas currents in a series of cyclones. U. S. 2,973,260.

### Removes Phosphorus

**Process for steel manufacture in a converter, P. Metz (assigned to A.R.B.E.D., Soc. Anonyme, Luxembourg), Jan. 3, 1961.** To remove phosphorus from steel melts, powdered lime is pressure injected into the melt. Low-pressure, pure oxygen blankets the supernatant slag. This forms a fluid and reactive slag. Canadian 611,994.

### Balling-Drum Cutter

**Cutter for balling drum, E. R. Makela (assigned to Reserve Mining Co.), Mar. 14, 1961.** A cutter-bar assembly controls the thickness of the iron-ore concentrate layer adhering to the inner surface of a balling drum. U. S. 2,974,358.

### High-Strength Steel

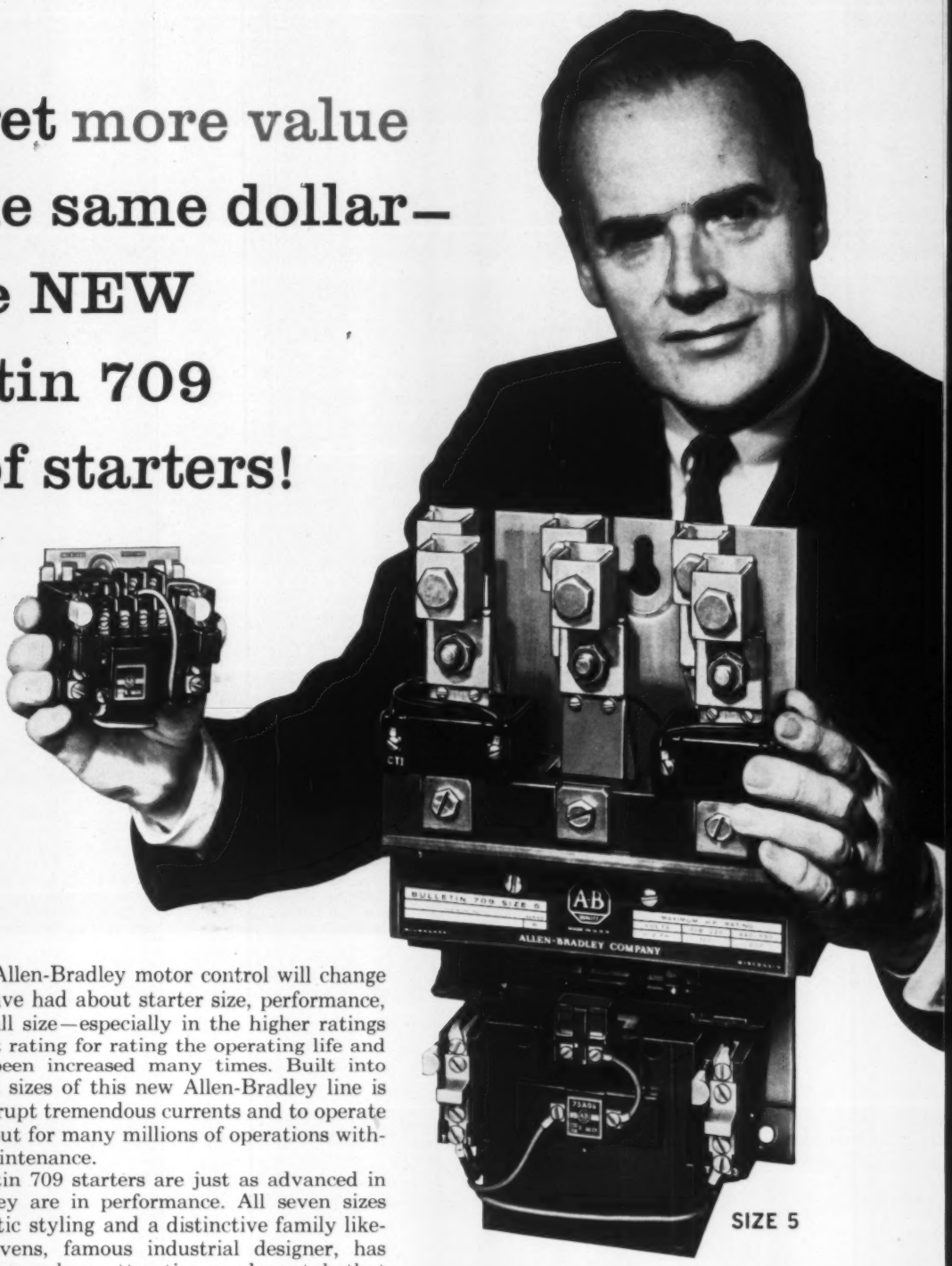
**Alloy steel, N. J. Culp (assigned to Carpenter Steel Co.), Feb. 7, 1961.** A high-impact-strength alloy steel consists of 0.2-0.8 pct C, 0.5-2.5 pct Mn, 0.5-1.5 pct Cr, 0.25-1.5 pct Mo, 0.65-4 pct Cu, and the remainder essentially all Fe. Canadian 614,173.

### Leaded Steel

**Method of making lead-containing steels, M. Tenenbaum, J. W. Halley and F. W. Luerssen (assigned to Inland Steel Co.), Feb. 7, 1961.** An improved method disperses small amounts of lead in molten steel. It yields a leaded steel, free of lead globules and particles. Canadian 614,274.

Copies of U. S. Patents are available at 25¢ each from Commissioner of Patents, Washington 25, D. C.

# You get more value for the same dollar— in the NEW Bulletin 709 line of starters!




SIZE 00

SIZE 5

This new line of Allen-Bradley motor control will change every idea you have had about starter size, performance, and life. The small size—especially in the higher ratings—is startling. Yet rating for rating the operating life and reliability have been increased many times. Built into each of the seven sizes of this new Allen-Bradley line is an ability to interrupt tremendous currents and to operate year in and year out for many millions of operations without trouble or maintenance.

The new Bulletin 709 starters are just as advanced in appearance as they are in performance. All seven sizes have an aristocratic styling and a distinctive family likeness. Brooks Stevens, famous industrial designer, has given the enclosures such an attractive, modern style that these new starters will prove a distinct sales asset on any machine or installation.

Why not write today for more information on this revolutionary new line of Allen-Bradley Bulletin 709 *quality* across-the-line motor starters?

Note the compactness of both the smallest and largest starter in the new Bulletin 709 line. Ratings up to 100 hp, 220 v; 200 hp, 440-550 v.

10-61-RM

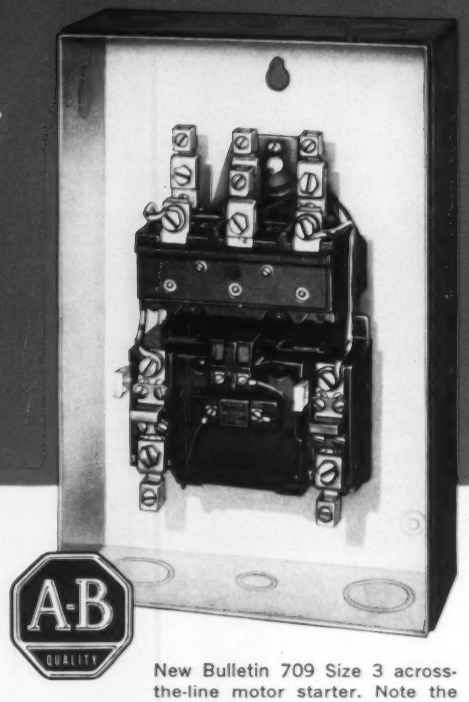
# ALLEN-BRADLEY

Member of NEMA

Allen-Bradley Co., 1316 S. Second St., Milwaukee 4, Wis.

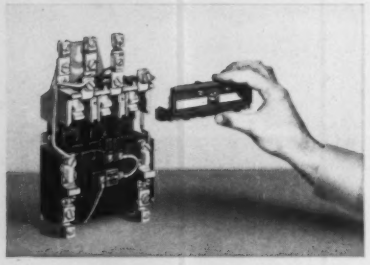
QUALITY MOTOR CONTROL

# Features of the NEW Allen-Bradley starter line that are of value to you!

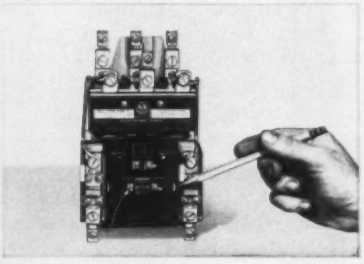



New Bulletin 709 Size 3 across-the-line motor starter. Note the generous space for wiring, accessible terminals, and white interior.

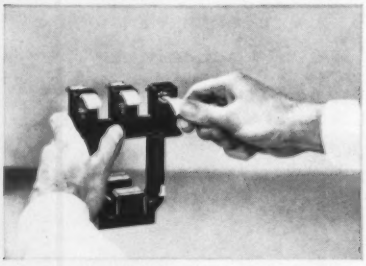
Every detail of the new Allen-Bradley motor starters has been designed to help make this the best line of motor control on the market. Remarkably small in size, each starter is a giant in performance. Being light in weight, these starters are easy to handle and a cinch to install. The generous wiring space, full front wiring, white interiors, and convenient knockouts make installation easy. The enclosure cover is firmly held with a quarter-turn fastener. All installation, inspection, and maintenance operations can be handled from the front—as shown in the illustrations below—without the use of special tools.



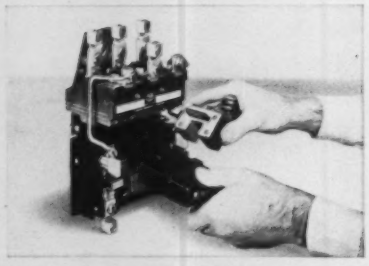
QUICK, EASY CONTACT INSPECTION—When the arc hood front cover is removed by loosening two captive screws, contacts are plainly visible from the front.



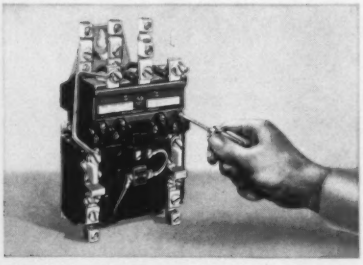
CONTACT POSITION INDICATED—Two slots in the coil cover show the position of the movable contact support—tell whether contacts are "closed" or "open."



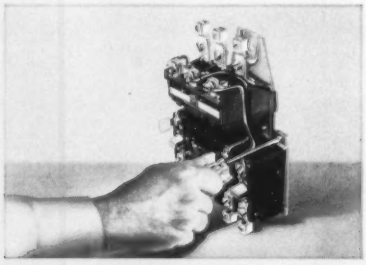
CONTACTS EASILY REPLACED—Depress the spring slightly, and the movable contacts can be lifted out of the molded support and the new contacts slipped in.



COIL EASILY CHANGED—When the coil cover is removed, coil and magnet yoke can be lifted out from the front. They are impossible to replace incorrectly.



AUXILIARY CONTACTS EASILY ADDED to the front of the starter. Two extra auxiliaries can be added to Sizes 0, 1, and 2 starters, and four, to Sizes 3, 4, and 5.



A THIRD OVERLOAD RELAY CAN BE EASILY ADDED in the field, from the front of the starter. And the only tool needed is a common screwdriver.

# ALLEN-BRADLEY

Member of NEMA

Allen-Bradley Co., 1316 S. Second St., Milwaukee 4, Wis.

**QUALITY MOTOR CONTROL**

# New Catalogues And Bulletins

**Money-saving products and services are described in the literature briefed here. For your copy, just circle the number on the free postcard.**

## Plant-Site Service

In looseleaf form, a large attractive notebook presents invaluable information on the Bessemer Area of Pennsylvania and eastern Ohio. The facts were compiled by the railroad serving the area. Its comprehensive text covers general information, transportation facilities and available building sites. The wealth of material is broken down county by county. There are charts of real-estate values and tax assessments, plus statistics on industry and the labor force. The notebook even has maps and data on the climate to further enlarge the picture. This item should be a must for any plant or industry planning relocation. (Bessemer & Lake Erie Railroad Co.)

**For free copy circle No. 1 on postcard**

## Humidity Control

Left to its own devices, humidity can cause tremendous damage. Controlling it in storage and work areas prevents spoilage and permits uninterrupted production. In 67 pages, an interesting catalog takes this point and describes a complete line of equipment to measure and control relative humidity. The catalog is broken down into three main divisions: Humidity measurement and control systems, electric-hygrometer instrumentation and a section dealing with miscellaneous devices. (Hygrodynamics, Inc.)

**For free copy circle No. 2 on postcard**

## This Is Oregon

Newly published by the Oregon State Department of Planning and Development is an extremely-attractive brochure describing that state's natural resources and advantages. The theme of the literature is: "How the abundance of this state can fit into your business and personnel life. . . ." It's broken down into eleven main categories—from financial resources to livability. Also included is a section on Oregon's industries.

**For free copy circle No. 3 on postcard**

## Crane Package Deal

Why not let your crane builder install it as well? An attractive brochure explains all about a package deal in which a crane manufacturer engineers, supplies and installs an operating crane unit at the customer's site. (Mayer Pollack)

**For free copy circle No. 4 on postcard**

## Milling spindles

Operating data and specifications of a full line of constant-horsepower, variable-speed milling spindles are ready in a new bulletin. The literature furnishes dimensions of importance in adapting these spindles to existing machine tools. (Colonial Broach & Machine Co.)

**For free copy circle No. 5 on postcard**

## Rubber Parts Research

Entitled "Versatility in Rubber," this interesting report points out the need for continuous analysis of rubber components used in manufactured products. It explains why molded-rubber parts over 5-years old are probably obsolete. (Roth Rubber Co.)

**For free copy circle No. 6 on postcard**

## Adjustable Drives

This 6-page booklet describes four types of complete, packaged, adjustable-speed drives. It gives details on available ratings, speed ranges, types of enclosures, asso-



Postcard valid 8 weeks only. After that use own letterhead fully describing item wanted. **4/27/61**

**Circle numbers for Free Technical Literature, Design Digest, or New Equipment:**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 |
| 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 |
| 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 |
| 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 |
| 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 |
| 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 |

**If you want more details on products advertised in this issue fill in below:**

Page ..... Product .....

Page ..... Product .....

Page ..... Product .....

INVALID WITHOUT COMPANY NAME AND TITLE
PLEASE TYPE OR PRINT

Name .....

Title .....

Product Manufactured .....

Company .....

Co. Address .....

.....

City ..... Zone .... State .....

FIRST CLASS
PERMIT No. 36
NEW YORK, N. Y.

**BUSINESS REPLY MAIL**
*No postage necessary if mailed in the United States*

POSTAGE WILL BE PAID BY

**THE IRON AGE**
Post Office Box 77, Village Station
NEW YORK 14, N. Y.

BUSINESS REPLY MAIL
No postage necessary if mailed in the United States

FIRST CLASS
PERMIT No. 36
NEW YORK, N. Y.

POSTAGE WILL BE PAID BY

THE IRON AGE

Post Office Box 77, Village Station

NEW YORK 14, N. Y.

Postcard valid 8 weeks only. After that use own letterhead fully describing item wanted. **4/27/61**

**Circle numbers for Free Technical Literature, Design Digest, or New Equipment:**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 |
| 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 |
| 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 |
| 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 |
| 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 |
| 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 |

**If you want more details on products advertised in this issue fill in below:**

Page ..... Product .....

Page ..... Product .....

Page ..... Product .....

INVALID WITHOUT COMPANY NAME AND TITLE
PLEASE TYPE OR PRINT

Name .....

Title .....

Product Manufactured .....

Company .....

Co. Address .....

.....

City ..... Zone .... State .....

# FREE LITERATURE

ciated controls and many standard and special modifications. (The Louis Allis Co.)

**For free copy circle No. 7 on postcard**

## Steel Shear Blades

Solid-steel and laid-steel shear blades are the subject of an illustrated bulletin. Tables show the recommended shearing application for each particular steel grade. It also recommends installation procedures. (Simonds, Worden, White Co.)

**For free copy circle No. 8 on postcard**

## Air-Clutch Mechanism

The subject of a 2-color industrial brochure is an exclusive air-clutch mechanism available on a line of industrial presses. The literature describes the advantages of the air clutch, including how it increases production and reduces upkeep. (Dechert Dynamics Corp.)

**For free copy circle No. 9 on postcard**

## Accelerometer

Design features of the newest addition to a family of strain-gage accelerometers are given in a 2-page bulletin. These characteristics include low cross-axis response and high resonant frequency. (Consolidated Electrodynamics Corp. a subsidiary of Bell & Howell)

**For free copy circle No. 10 on postcard**

## Industrial Vacuum

Seventy-nine time and money saving cures, for housekeeping headaches in the shop or factory, are passed along by a free handbook. It suggests new ideas and improved ways to do dozens of back-breaking jobs with an industrial vacuum-cleaning unit. The handbook enables you to rate the efficiency of your present cleaning methods. (Breuer Electric Mfg. Co.)

**For free copy circle No. 11 on postcard**

## Stationary Die Heads

A new bulletin contains all the details on a stationary die head with five chasers. These units suit turret lathes, hand-screw machines and other applications where the die head does not rotate. Information on the throw-away insert chasers explains the savings that their use can realize. Also, the reasons for their low cost are spelled out. (The Eastern Machine Screw Corp.)

**For free copy circle No. 12 on postcard**

## Potted Thermostats

Moisture, corrosion, fumes or dust don't affect the thermostats described by this illustrated bulletin. It gives ratings and tolerances, discusses design features. Potted construction provides an atmosphere seal for the units. (Stevens Mfg. Co., Inc.)

**For free copy circle No. 13 on postcard**

## Electric Interlocks

Three new interlock switches, that automatically cut current when the enclosure door is opened, are described in a blue and white data sheet. The newcomers suit a great variety of uses, including data-processing consoles, transmitters and computers. (Minneapolis-Honeywell Regulator Co.)

**For free copy circle No. 14 on postcard**

## Pure Solder Foil

Complete specifications on high-purity solder foil are included in a new data bulletin. In addition to special alloys, the literature lists 32 standard alloys available as foil. This information includes composition, softening and melting points. (Accurate Specialties Co., Inc.)

**For free copy circle No. 15 on postcard**

## Silver Brazing Alloys

Revised and expanded, a 24-page manual discusses brazing procedures, problems and solutions. Illustrations and diagrams supplement the text. The easy-to-read diagrams are particularly useful. They help you select the proper alloy to meet particular industrial needs. (Air Reduction Sales Co., a div. of Air Reduction Co., Inc.)

**For free copy circle No. 16 on postcard**

## Duplex Grinder

An illustrated folder highlights the advantages of a new double-end internal grinder. It includes detailed descriptions of machine movements, a schematic, a close-up of the tooling area and complete operating specifications. The machine grinds both a straight and a tapered bore at a single chucking. (Bryant Chucking Grinder Co.)

**For free copy circle No. 17 on postcard**

*Electric and open hearth steel castings from 1 lb. to 100 tons*

**PITTSBURGH**

**ENGINEERING & MACHINE DIVISION**

pittsburgh steel foundry • a textron company

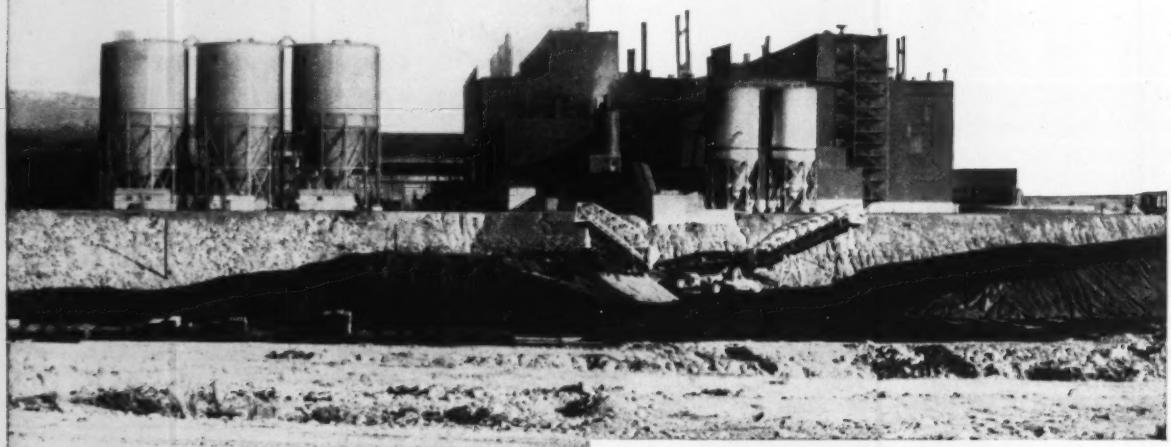
564 FORBES AVE., PITTSBURGH 19, PA. • PLANTS AT GLASSPORT AND McKEESPORT, PA.

# How Pneumatic Conveying Helps Make New Mining Process Economically Practical

Taconite processing is typical of the many varied, cost-saving applications for Fuller Pneumatic Conveying.

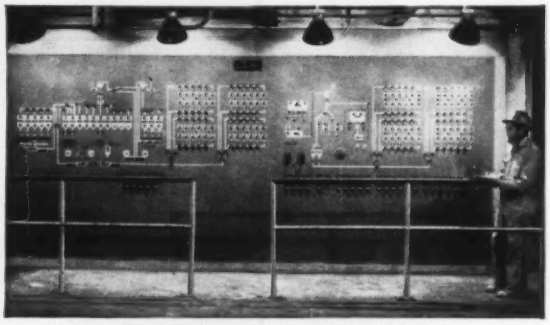
They're turning low assay iron ore into rich pellets on the Mesabi these days. Moving additives for pelletizing, Fuller plays a special role in this feat of engineering and production economy.

Fuller Pneumatic Conveying Systems are carrying fine anthracite screenings, soda ash, and bentonite from siding to storage to processing—with speed, safety, sanitation, and efficiency. With few moving parts to wear out and powered by inexpensive low-pressure air, Fuller Pneumatic Conveying Systems speed dry bulk materials *anywhere that a pipeline can be run:* under ground, up through floors, around corners . . . for far greater distances and at substantially lower cost than possible with mechanical conveyors.



Four Fuller Pneumatic Systems can speed more than 307 long *tons* of additives through this huge Taconite Pelletizing Plant in a single day.

Fuller Pneumatics Can Work For You, Too—as easily and profitably as it does in a score of industries from baking to mining to paper. If you move dry bulk materials, write today and learn how you can move further—for less—with air.



Centralized control is provided by giant panel designed and manufactured by Fuller.

*See Chemical Engineering Catalog for further details and specifications*

FULLER COMPANY
GENERAL AMERICA

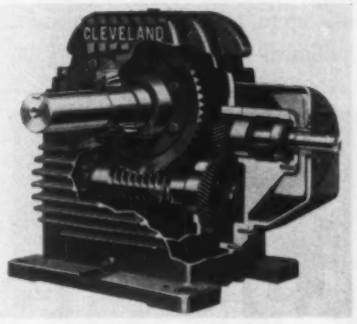
**FULLER COMPANY**
**122 Bridge St., Catasauqua, Pa.**
Subsidiary of General American Transportation Corporation
Offices in Principal Cities Throughout the World

**Fuller**
....pioneers in harnessing AIR

2097
G229

# New Materials and Components

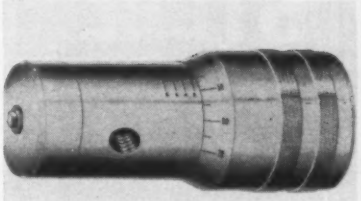
## Worm-Gear Speed Reducers Handle Heavy Loads




Oversized ball and tapered-roller bearings support the shafts on a line of fan-cooled speed reducers. This enables them to take heavy radial and thrust loads. For good wear and fatigue resistance, the worm gears are cut from bronze with a high tin-copper content. The units come in ratios extending from about 34:1 to 394:1. Also, seven sizes cover the range from 4- to 12-in. center distances. Ratings are fractional to 58.5 hp. On the larger sizes, both primary and secondary gear trains share a common housing. Separate housings serve the 4-6 in. models. In all sizes, both gear reductions utilize a common oil bath. (Eaton Mfg. Co.)

For more data circle No. 21 on postcard, p. 121

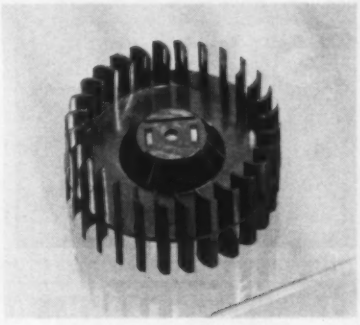
## Pressure Regulators Boast Micrometer Adjustment



Micrometer accuracy distinguishes new pressure regulators. Suiting supply pressures to 150 psi, they maintain outlet pressure, despite varying inlet pressure or flow. A sensitive spool instantly corrects for changes. Accuracy is ±0.25 pct. Several noteworthy design features account for this performance. For instance, the floating spool eliminates valve seats. This, in turn, halts damage from surges. (Circle Seal Products Co., Inc.)

For more data circle No. 22 on postcard, p. 121

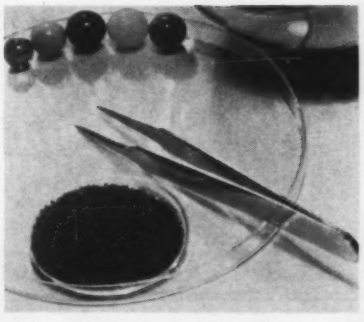
## Nylon Resins Boost Output of Injection-Molders



Two new nylon 6 resins speed-up the production of injection-molded parts. In many cases, their use reduces cycle time on injection molding machines up to 40 pct. Molding time, for the blower rotor shown in the photo, was cut from 51 to 30 seconds. This unit represents a difficult molding job bacause of its 28 thin-section vanes. Uses for the resins range from miniature parts produced in multiple-cavity molds to thick-section parts from single-cavity molds, taking up to 3-lb per shot. Increased flow properties account for the cycle-time reduction. This also means lower ram pressure and heater settings. (Spencer Chemical Co.)

For more data circle No. 23 on postcard, p. 121

## Precision Spheres Aid Research and Development



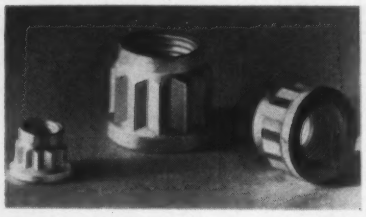
Precision balls of special materials are now available in both prototype and production quantities. Among the newer materials are: Boron carbide, titanium diboride, glass-filled Teflon, Indox I, ferrites, synthetic rubies, tantalum, titanium carbide and high-density aluminum oxides. Balls of these materials have great possibilities in cases where temperature and load extremes are severe. They also suit applications requiring corrosion resistance, magnetic or non-magnetic qualities, dielectric properties or controlled density. For research and development purposes, the high-purity metal spheres come in a wide range of sizes and tolerances. (Industrial Tectonics, Inc.)

For more data circle No. 24 on postcard, p. 121

## DESIGN DIGEST

### Locks at 1400°F

Made of a nickel-base alloy, a high - temperature locknut suits space-age applications. The newcomer mates with the nickel-base family of bolts, and develops high-strength at up to 1400°F. It also has limited application with these bolts up to 1600°F. Principal uses, envisioned for the locknut, are on jet and rocket engines, missiles, gas turbines and other power generation equipment. At room temperature, the units rate at 180,000 psi, minimum tensile strength. At 1200°F,

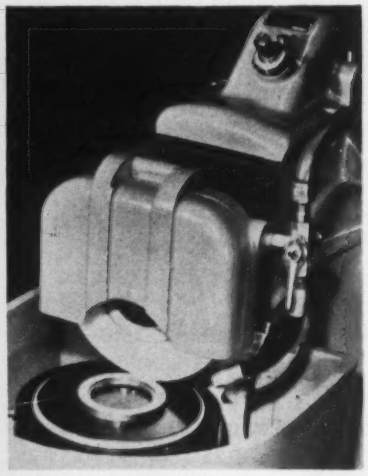


it's 130,000 psi and at 1400°F, 100,000 psi. Typical or average values are somewhat higher. (Standard Pressed Steel Co.)

For more data circle No. 25 on postcard, p. 121

### Rotary Chuck

Electrostatic chucking solves many of the difficult problems encountered in holding flat, ring-

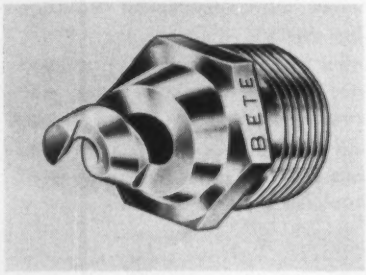


shaped parts for surface grinding. Unlike magnetic chucks, the electrostatic units will hold any conductive material. Thus, they can handle brass, copper, aluminum, stainless steel, beryllium and other exotic materials. Another advantage of electrostatic chucking, even on magnetic materials, is the complete absence of residual magnetism in finished parts. (Electroforce, Inc.)

For more data circle No. 26 on postcard, p. 121

### Spiral Nozzles

These new nozzles, all pinless-spiral design, round out a line by providing intermediate capacities.




All are made from one piece of material. They give good atomization at low pressures. The nozzles come in 4- and 8-gpm capacities, at 40 psi, with wide- or narrow-angle and full- or hollow-cone pattern. Each model is available in brass, Type 303 stainless, Teflon, PVC, plastic or hard rubber. (Bete Fog Nozzle, Inc.)

For more data circle No. 27 on postcard, p. 121

### Measures Forces

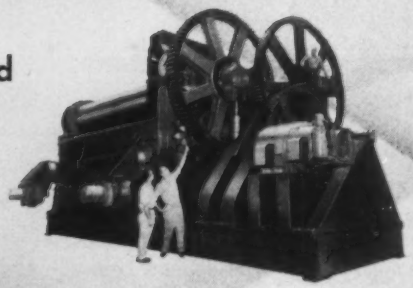
Fast response and high accuracy earmark a force transducer. It senses and measures tension, pressure, weight and thrust for control purposes. It measures continuously. A system of cross-spring pivots,

WARD
For Countless Uses
of
SPRING STEEL

AMERICA'S LEADING SUPPLIER
Where
SERVICE and QUALITY
is the rule

WARD STEEL CO.
Boston—Cambridge, Mass.
Chicago, Ill.—Greensboro, N. C.

INITIAL PINCH TYPE PLATE BENDING ROLL
Capacity
to 6 inch plate cold



The LARGEST
ever built

Our Line
Light and heavy machinery for all classes of sheet metal, plate and structural work

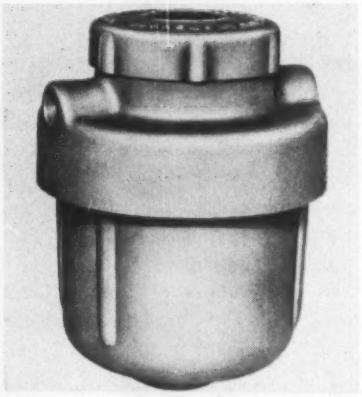
BERTSCH & COMPANY, CAMBRIDGE CITY • INDIANA

combined with a flat cantilever main spring, is the key to the transducer's accuracy. The pivots prevent any movement of the load platform in crosswise or lengthwise planes. But, they allow flexure in a third plane. This feature permits direct mounting on the unit. (Hydro-Pneu-Tronics, Inc.)

**For more data circle No. 28 on postcard, p. 121**

## Oil Filter

Positive protection for oil-hole drilling and reaming, tapping, threading, burnishing, and all types of lubrication systems is provided by a new line of oil filters. One model has 5-gpm capacity. It incorporates all the advanced features of an earlier model, proved out in



hundreds of installations. These filters can be installed easily. They cause no pressure drop. Permanent magnets in the filters remove magnetic particles from oils, coolants or other liquids. (Sinclair Machine Products, Inc.)

**For more data circle No. 29 on postcard, p. 121**

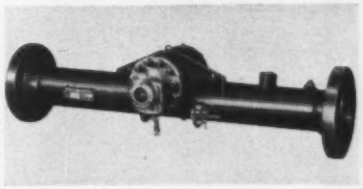
## Monitors Flame

Presampling an air-gas mixture, a new instrument indicates changes in flame characteristics. Designed for industrial use, the device permits adjustment of the air-gas ratio before production is adversely affected. It should be very useful where the transfer rate must be maintained to meet exacting time-temperature cycles. All the operator needs to do is keep the needle on zero. This will assure even combustion. The indicator detects changes as little as 5 Btu in fuel gas and 0.5 pct air in air-gas ratio. Typical industrial applications are in glass-bending lehrs, forging furnaces and aluminum brazing. The continuous-reading device senses changes in five seconds. (Selas Corp. of America)

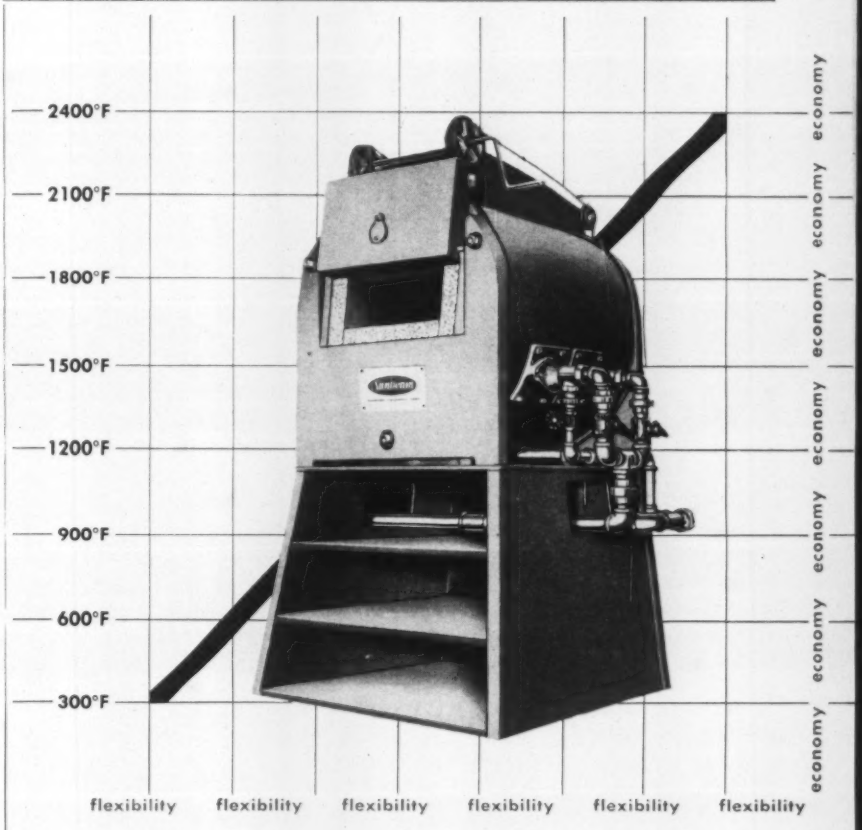
**For more data circle No. 30 on postcard, p. 121**

## Vortex Velocity Meters

Three new flowmeter models provide accurate measurements of gas or liquid flow at high pressure. A 6-in., an 8-in. and a 16-in. unit each come in separate models, one



for gas and one for liquid. All the flowmeters work on the vortex-


**Wide Range Furnace has 300°F–2400°F temperature range**

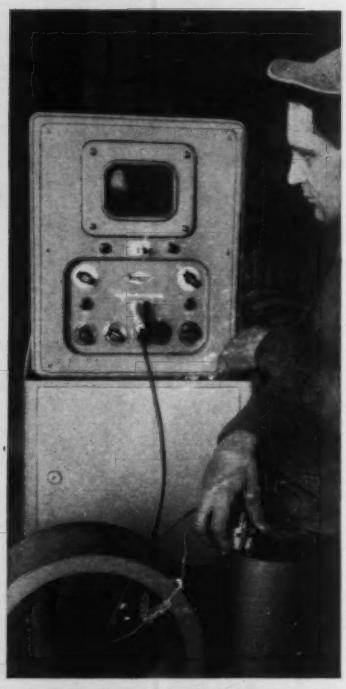
**Can the Flexibility and Economy of this all-in-one furnace help you solve your heat treating problems?**

Now you get two big cost saving advantages in batch heat treating . . . more flexibility and more economy. Both with the Wide Range Furnace.

Before, you had to use several different furnaces if you wanted to heat treat over a broad temperature range. But now with the Sunbeam Wide Range Furnace, you can do all of your batch heat treating—annealing, box carburizing, normalizing, preheating, stress relieving and tempering—using only one furnace.

The Sunbeam Wide Range Furnace will pay for itself quickly—in fast production —less floor space and reduced labor. Let us give you full details on specifications and sizes. **Write or phone Sunbeam Equipment Corporation, 200 Mercer Street, Meadville, Pennsylvania.**

**For any heat process, see** Sunbeam **The Best Industrial Furnace Made**



# SALES UP 20%

**THROUGH**

**ULTRASONIC TESTING**

Monroe Forgings, Inc. of Rochester credits the use of Sperry ultrasonic testing with a 20% increase in volume since its installation.

Ultrasonic testing has virtually eliminated customer rejections at Monroe — creating a substantial saving in production time, man hours and material costs and it has enabled Monroe Forgings to compete in fields demanding the utmost in quality and reliability.

A Sperry engineer will be happy to show you how easily a Reflectoscope can be fitted into your production picture and how quickly its low cost can be amortized even by relatively small companies.

ULTRASONIC
Leader in Nondestructive Testing X-RAY
MAGNETIC

SPERRY
PRODUCTS COMPANY
DIVISION OF HOWE SOUND COMPANY
34 SHELTER ROCK RD., DANBURY, CONN.

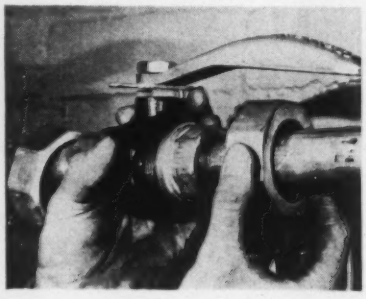

## DESIGN DIGEST

velocity principle of flow measurement. An offset chamber on the side of the pipe develops a natural vortex. This vortex rides on the main stream like a pulley on a belt. There's a linear relationship between the number of revolutions of the vortex and the volume of main flow. (Rotron Controls Corp.)

For more data circle No. 31 on postcard, p. 121

### Valve Assemblies

An entirely new concept in ball-valve design boasts major improvements in sealing characteristics. It's a compact one-piece forging with built-in union ends. This simplifies installation, operation, and maintenance. Engineered for rapid installation and fast disassembly for maintenance, the new ball valve can control the flow of liquids or gases. Only two steps are required for installation. The union ends are either screwed or welded on to the pipe

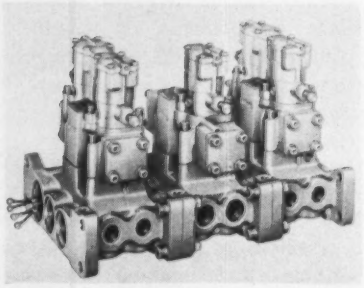


ends. Then, a one-piece valve body is easily assembled to the union nut. Minor pipe misalignment is overcome by the union ends. In addition, the simplified design of the valve body and union ends eliminates the need for nuts and bolts and an extra union in the line. (Clayton Mark & Co.)

For more data circle No. 32 on postcard, p. 121

### Assemble Valves

A multiple manifold sub-base speeds the mounting of any desired combination of ½-in. single- or double-solenoid, 4-way plug-in control valves. Designed for use in the building-block concept of machine design and construction, the new sub-base facilities ganging of up to 10 valves in a single space-saving unit. Each sub-base has common



inlet, exhaust and conduit ports, with provisions for O-ring seals and connecting bolts to permit end-to-end ganging of individual assemblies. (Bellows-Valvair, Div. of IBEC)

For more data circle No. 33 on postcard, p. 121

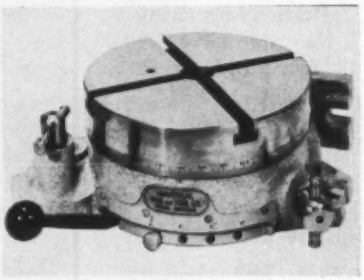
### Limit Switch

Suitable for hazardous locations, an explosion-proof limit switch conforms with UL standards. The housing of the switch is a rugged, heavy-duty non-sparking aluminum casting with metal-to-metal seal. The switch mechanism attaches to the cover and plugs into the terminal block in the base. Mechanical features include short-trip differential, extreme repetitive accuracy, liberal safety overtravel and light operating force to trip. (R. B. Denison Mfg. Co.)

For more data circle No. 34 on postcard, p. 121

### Precision Spacer

After indexing, a new spacing tool automatically locks. It's for use on milling, drilling, grinding and other toolroom and production-ma-



chining operations. The unit features a quick-action actuating lever and a choice of seven different divisions in the standard model. By changing the selector button, the

# Call Crucible for special steels and special service

**Crucible's inside account salesman confirms availability and delivery of any specialty steel — while you're on the phone.**

In fact, he can confirm local delivery of any of the thousands of specialty steel items he carries in stock.

He takes personal responsibility, too, for cutting through any problems of scheduling, shipping or processing that may be plaguing you. He can also arrange for heat treating, forging, buffing, etc. at the lowest possible cost. And he'll answer your questions about metalworking, or get help if he can't.

He makes steel-buying easy because he's a trained, experienced steelman — who knows the most efficient means of getting alloy, tool and stainless steels from Crucible to you. Just ask for the inside account salesman at the local Crucible steel center. Or write: *Crucible Steel Company of America, Four Gateway Center, P.O. Box 88, Pittsburgh 30, Pa.*

**CALL CRUCIBLE**
— and ask to have your name added to the mailing list to receive local stock lists.

**CRUCIBLE STEEL COMPANY OF AMERICA**

# 63 SIZES
## READY TO SHIP

*centrifugally cast*

## Stainless Steel

**SLEEVES • LINERS**
**CORED BAR STOCK**

In a rush? Order from Vollrath for immediate off-the-shelf shipment. All 13¼" long. Semi-machined to ⅛" of sizes listed. Uniform quality.

**TYPES 304 and 316**

| O.D. | I.D. | O.D. | I.D. | O.D. | I.D. |
|---|---|---|---|---|---|
| 2½ | x 2 | 4 | x 2 | 4½ | x 3½ |
| 2¾ | x 2 | | x 2¼ | | x 3¾ |
| | x 2¼ | | x 2½ | | x 4 |
| 3 | x 2 | | x 2¾ | 4¾ | x 2¼ |
| | x 2¼ | | x 3 | | x 2½ |
| | x 2½ | | x 3¼ | | x 2¾ |
| 3¼ | x 2 | | x 3½ | | x 3 |
| | x 2¼ | 4¼ | x 2 | | x 3¼ |
| | x 2½ | | x 2¼ | | x 3½ |
| | x 2¾ | | x 2½ | | x 3¾ |
| 3½ | x 2 | | x 2¾ | | x 4 |
| | x 2¼ | | x 3 | | x 4¼ |
| | x 2½ | | x 3¼ | 5 | x 2½ |
| | x 2¾ | | x 3½ | | x 2¾ |
| | x 3 | | x 3¾ | | x 3 |
| 3¾ | x 2 | 4½ | x 2 | | x 3¼ |
| | x 2¼ | | x 2¼ | | x 3½ |
| | x 2½ | | x 2½ | | x 3¾ |
| | x 2¾ | | x 2¾ | | x 4 |
| | x 3 | | x 3 | | x 4¼ |
| | x 3¼ | | x 3¼ | | x 4½ |

PHONE • WIRE • WRITE

**the Vollrath Co.**

**FOUNDRY DIVISION**
*Dept. 1A, Sheboygan, Wis.*

For sheet stainless steel items, drawn or spun, consult our Contract Sales Division.

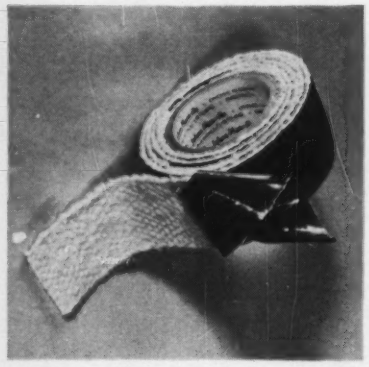

## DESIGN DIGEST

user has a choice of 2, 3, 4, 6, 8, 12 or 24 divisions. Platen models are 9-in. diam. However, an 8-in. chuck is also furnished. (The Universal Vise & Tool Co.)

**For more data circle No. 35 on postcard, p. 121**

### New Asbestos Tape

Asbestos tape with a pressure-sensitive adhesive backing is now available. The new product offers many advantages in industrial applications where asbestos tape is needed for assembly purposes. The adhesive holds the tape in place while parts are positioned or cov-

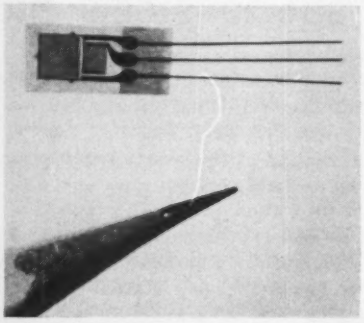


ers applied. The tape suits services up to 500°F in commercial grades. Its use in an unsupported structure is limited, however, to 275°F, the point at which the adhesive begins to lose strength. (Johns-Mansville)

**For more data circle No. 36 on postcard, p. 121**

### Stress-Strain Gage

Here's a unit that takes the task out of obtaining stress readings in many tests and measurements. It's



a strain gage with a built-in computer that solves general strain-to-stress equations. Time-consuming calculations of stresses from strain indications are unnecessary. Two sensing elements, orientated 90° apart, measure stress along the principal axis—strain in both axial and transverse directions. (Baldwin-Lima-Hamilton Corp.)

**For more data circle No. 37 on postcard, p. 121**

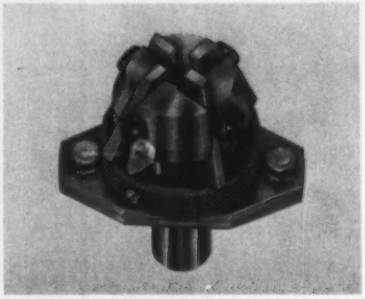
### Shaft Oil Seals

With a Teflon-filled sealing element, a new oil seal offers the built-in performance demanded by engineers. The newcomers resist extreme temperatures, and are chemically inert. Corrosion doesn't affect them. Here are some construction features: Steel case which encloses all component parts, special gasket to hold the sealing element in place and a Teflon sealing element riding firmly against the shaft. The seals will not score the shafts on which they are used. (Garlock, Inc.)

**For more data circle No. 38 on postcard, p. 121**

### Hollow Mills

New aligning-type hollow mills, designed primarily for Browne & Sharpe and Davenport automatics,



have straight shanks to suit these machines. A built-in, self aligning feature quickly corrects any machine misalignment. In addition, the mills eliminate separate holders and shorten tool overhang. Capacity range is from zero to ⅜ in. Increments are ⅛ in. (Genesee Mfg. Co.)

**For more data circle No. 39 on postcard, p. 121**

### Conveyor Line

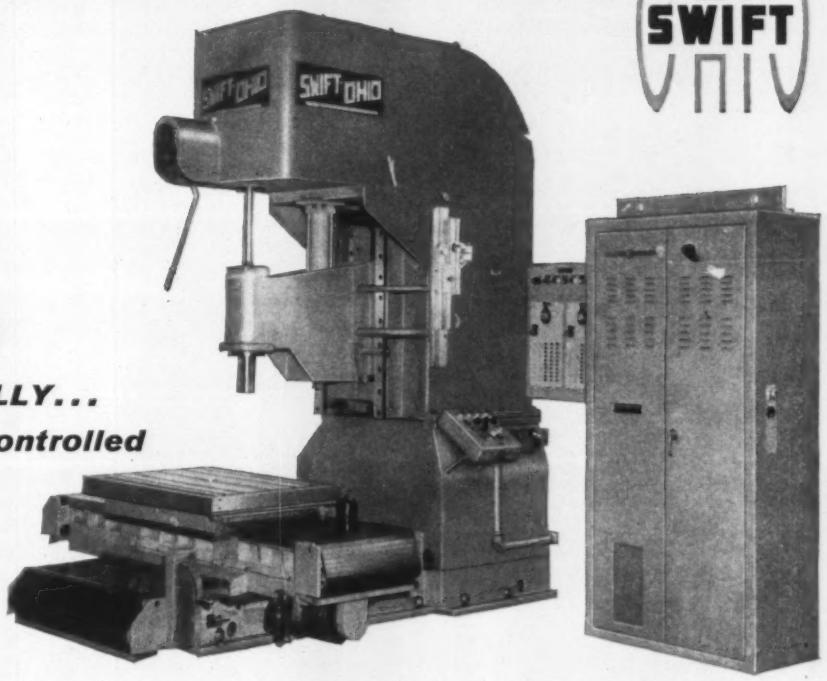
Double lines of chemical-filled aerosol cans ride through a hot-water bath, then uphill at Cincinnati Aerosol Corp. These cans are held fast to the conveyor belt by unseen rails. The permanent magnetic rails are mounted directly

# NEW and Different Approach To PROGRAM CONTROL by SWIFT OHIO

NOW...

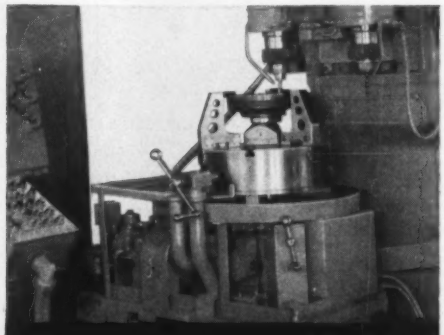
- Drilling
- Boring
- Tapping
- Positioning

***AUTOMATICALLY...***
***or MANUALLY Controlled***

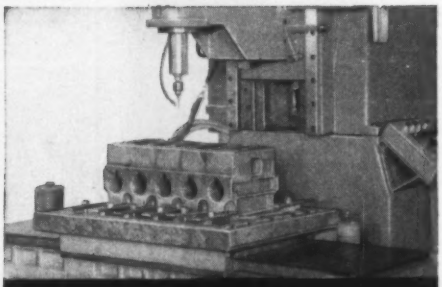



New SWIFT OHIO No. 425 upright heavy duty Drill with numerically controlled 24" x 36" compound table, hydraulic feed to spindle, 18 spindle speeds 52 to 2250 RPM, fine and coarse feed range.

Above unit has General Electric Mark II Numerical Control —repeatable accuracy of ±.0005". Also features complete manual control and manual decade positioning.



Positioning Blox* method with push button selective control, rotary index sequencing, optional double spindle, vertical or horizontal programming, 2" to 14" dia. holes, to 2" thickness.



Typical tape controlled production operation. Complete part set up change time, less than 10 minutes. SWIFT OHIO positioning tables may also be used with other machine tools—as radial drills, milling machines, etc.

## Fast—Simplified Machine Set-Up

SWIFT OHIO provides a whole new concept in controlled programming—greater versatility by use of any type electrical automatic cycling operation, with complete unit positioning—or optional selective manual positioning!

By simplified machine set up through direct reading scales and cams to determine location of positioning Blox*, this new SWIFT OHIO programming eliminates need for many jigs and fixtures for normal drilling, tapping, and boring operations.

This versatility broadens the practical and profitable use of this machine to include job shop, maintenance department, and limited production plant operations—in fact, for any application where pre-determined positioning on limited production items has been cost and time handicapped by need for extensive set up, jigs, fixtures, and large inventory storage!

*Copyright. 1961

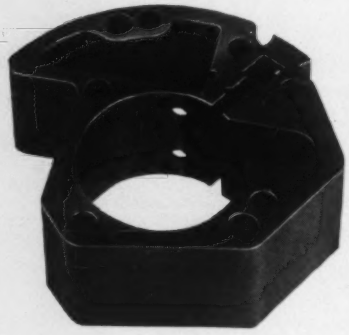
*Get all the facts—*
*Write or phone today!*

SWIFT OHIO

**SWIFT OHIO CORP., KENTON, OHIO**

SINCE 1887—MULTIPLE-OPERATION EQUIPMENT FOR WELDING, MACHINING, ASSEMBLY, SPECIAL MACHINERY

**BEFORE BRUSHING**
*Corners of intricate multiple contours were hand-filed to remove burrs. Results were inconsistent. Former production rate:* **24** *per hour.*



**AFTER BRUSHING**
*All surface junctures are blended accurately to predetermined specifications. Results are uniform...quality is high. Osborn 3-A Machine production rate:* **63** *per hour.*

# Production up 162% on this finishing job

## ...with OSBORN power brushing

**PUSH-BUTTON FINISHING OPERATION . . .** *with Osborn 3-A Machine using Osborn Economy Wire Brushes. Operator simply loads part...starts pre-set brushing cycle... and unloads part after brushing.*

Formerly, this air conditioner manufacturer finished 24 compressor bodies per hour. He now finishes 63 per hour...*a 162% increase in production.* But that's just the start.

Quality now is uniform because Osborn power brushing thoroughly removes all burrs that might ultimately damage the compressor. Each surface juncture of the intricate contour is also formed to an exacting, predetermined blend . . . all automatically.

Your Osborn Brushing Analyst will gladly provide complete details. He will show how you can benefit on similar operations in your own plant.

Write now for full details on Osborn Metal Finishing Machines. *The Osborn Manufacturing Company, Department F-109, Cleveland 14, Ohio.*

VISIT OUR Bbooth '61 ASTME TOOL EXPOSITION

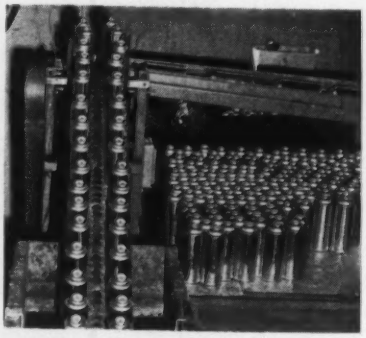
Booth 2407

OSBORN

Metal Finishing Machines...and Methods • Industrial Brushes • Foundry Production Machinery




beneath the non-magnetic, stainless steel belt. A powerful and continuous magnetic field steadies cans as they move through the test tank, where water at 150°F builds up sufficient pressure within the cans to

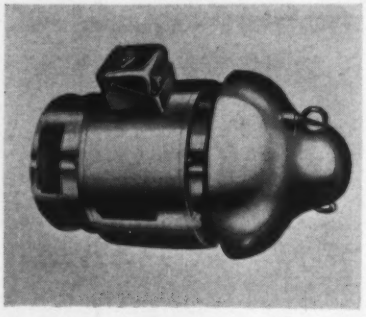


leave a tell-tale trail of bubbles wherever a leak exists. The steel cans, moving in a double line at speeds of up to 20 fpm, cling tightly to the submerged, magnetized belt —yet may be easily removed from the bath for inspection. (Eriez Mfg. Co.)

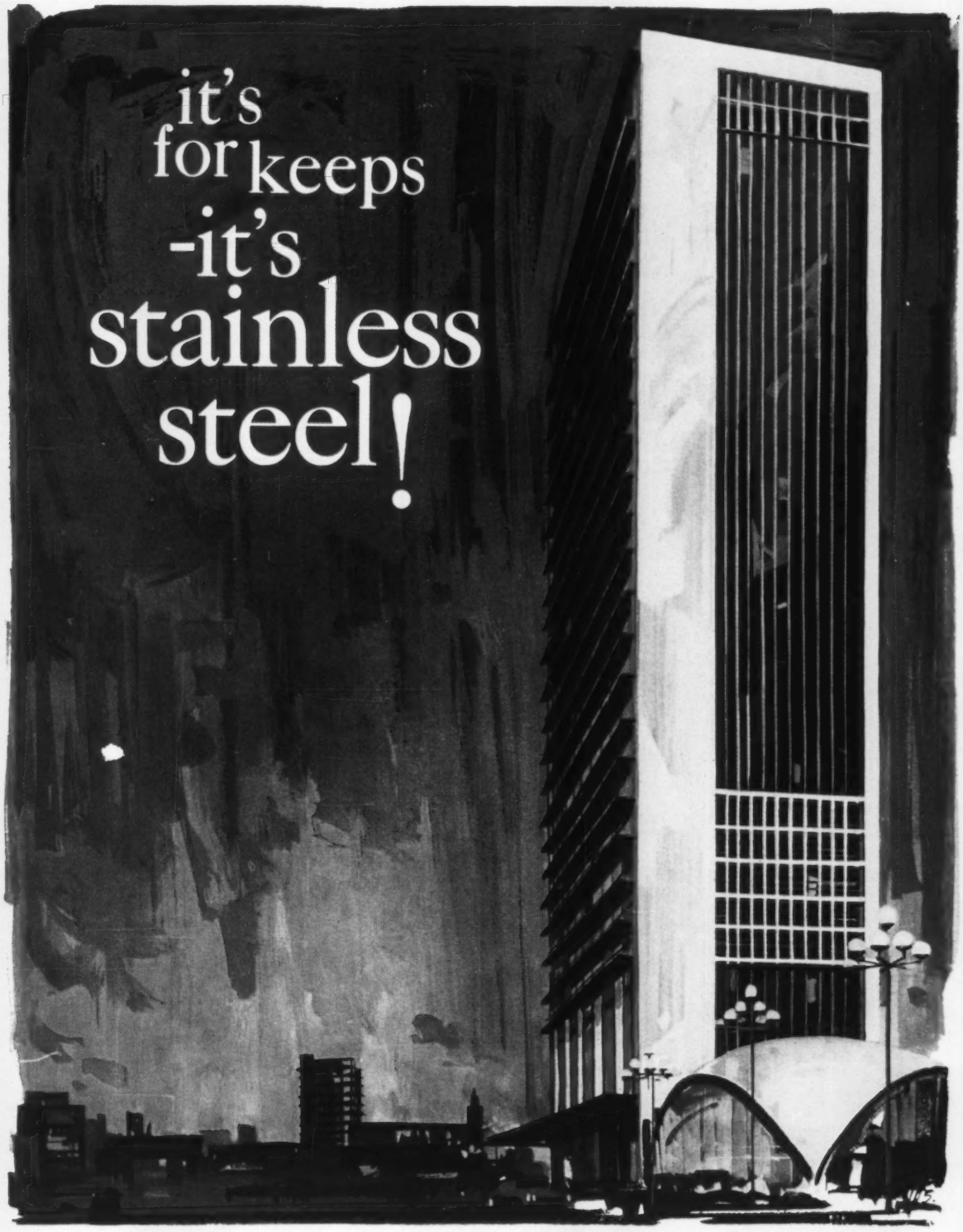
**For more data circle No. 40 on postcard, p. 121**

### Pump Motor

Vertical hollowshaft motors have wide application wherever water is to be lifted, distributed or circulated with centrifugal pumps. Typical applications include: Circulating anodizing tanks, spray booths, and emergency inplant water systems. Wide usage is also found in agriculture and municipal-water installations. Special weather protection is provided by the units, since installa-



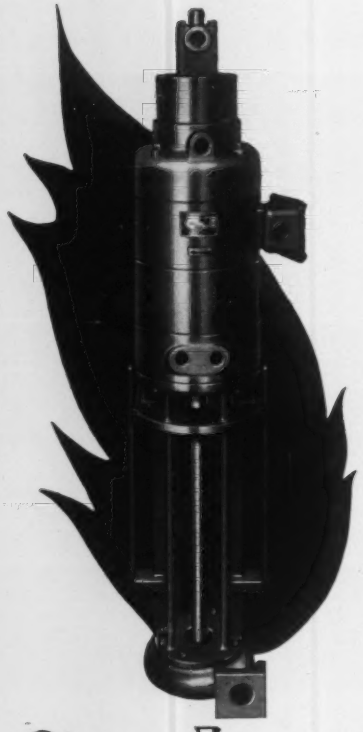
tions are often exposed. All windings are impregnated with a special varnish; then permanently cemented into a single solid mass by a special double-immersion and baking proc-




Stainless—the building metal of permanence, economy and beauty.
McLouth Steel Corporation, Detroit 17, Michigan

Look for the **STEELMARK** on the products you buy

**McLOUTH STAINLESS STEEL**



Gusher
MOLTEN
METAL
PUMPS
*For Handling Molten*

• Lead • Zinc • Salt
• Spelter • Babbitt

Gusher Molten Metal Pumps are tested under operating conditions and have proved that they will give efficient performance under recommended temperatures and conditions of operation. Models 15028E and 15028XE are suitable for temperatures up to 1000° F. Model 9075M with or without closed water jacket for temperatures up to 750° F. Other models from ¼ HP to 10 HP. Write for information and illustrated folder.

Ruthman
MACHINERY CO.

• MOLTEN METAL PUMPS • COOLANT PUMPS
• CIRCULATORS • AGITATORS

1825 Reading Road
Cincinnati 2, Ohio


## DESIGN DIGEST

ess. Extra heavy-duty insulation on all slot cells, end connections and flexible leads provides maximum dielectric strength. (Reuland Electric Co.)

For more data circle No. 41 on postcard, p. 121

### Die-Thread Head

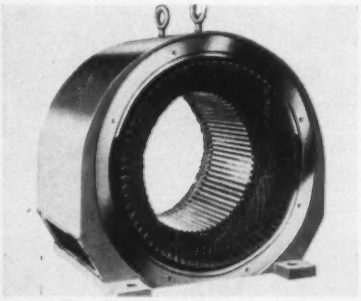
Production rates of about 60 pieces per minute are possible with a new attachment for a cylindrical die-thread and form-rolling machine. The unit is a high-speed oscilating head. Coupled with semi-automatic or fully-automatic work-handling equipment, the oscillating head boosts production 50-100 pct to the 60 per minute figure. This

high production rate results from the use of aluminum in the cam-actuated oscillating head. This reduces the weight of the complete head assembly. Also, a heavy cam lever keeps the cam roll against the cam at high speeds. (Reed Rolled Thread Die Co.)

For more data circle No. 42 on postcard, p. 121

### Motor Insulation

Providing added protection to windings against moisture, chemicals, oils and abrasive contaminants,



a new insulation system increases the life of open motors used in unfavorable environmental conditions. This system features rectangular copper conductors covered with a basic insulation of fused Dacron and fibers, which are formed and impregnated with a high-dielectric, insulating varnish. The varnish penetrates the spaces between the conductors and augments the basic insulation on the copper. (The Louis Allis Co.)

For more data circle No. 43 on postcard, p. 121

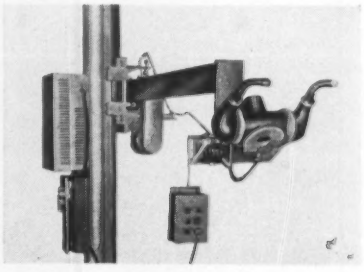
### Larger Frames

A new line of ac motors and generators features larger frames for faster response and lower vibration. The ribbed construction at the frame base gives self-supporting, pre-aligned rigidity. Moreover, the use of brackets and ballbearings reduces weight and the required floor space. Typical motor ratings are 500 hp at 850 rpm from 240-v ac. Corresponding generator ratings are 480 kw at 850 rpm from a 250-v dc power supply. (Westinghouse Electric Corp.)

For more data circle No. 44 on postcard, p. 121

### Positions X-Ray Head

A slightly-modified welding-head manipulator positions an X-ray head at Oak Ridge, Tenn. This kind



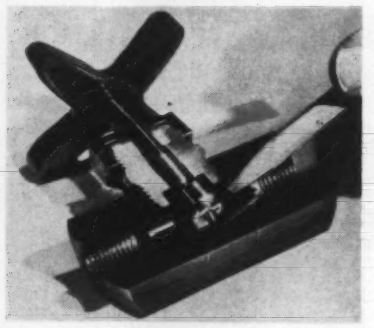
of movement is difficult and complex without the proper equipment. The positioning device adjusts the X-ray beam from horizontal to vertical. It also positions the beam 45° on either side of the manipulator boom. (The Ransome Co.)

For more data circle No. 45 on postcard, p. 121

### High-Pressure Valve

High-pressure, shut-off valves feature Teflon seats which compress into positive-sealing O-rings. A stainless-steel swivel cage, at-

tached to a free-turning stem, houses the valve seat. As the stem screws down to the closed position, it forces part of the Teflon from the cage. This forms a Teflon to metal seal. Surprisingly enough, there's



no danger of galling. A special swivel design takes care of it. Here's another item of interest to the maintenance man: When the valve is closed, you can replace the stem packing without removing the valve from the line. (Clayton Mark & Co.)

For more data circle No. 46 on postcard, p. 121

## Precision Shaft Locks

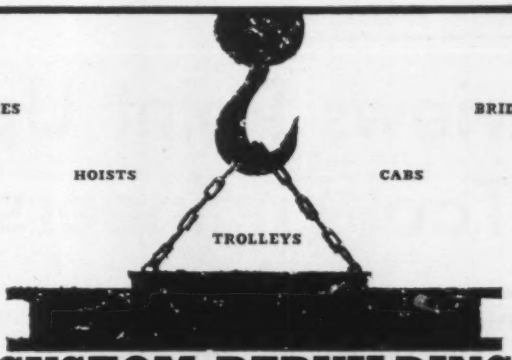
An improved series of precision shaft locks is ready for immediate delivery. They're for use on potentiometers, capacitors, coils and other shaft-type controls. Stocked in two styles, knurled hand nut or wrench hex nut, these collet-type locks fit ⅛- and ¼-in. shafts. You have your choice of passivated-stainless steel or black-anodized aluminum. (PIC Design Corp.)

For more data circle No. 47 on postcard, p. 121

## Welding Regulator

Without other heat sources, an air-heated regulator avoids freeze-up of flow-control equipment in metal-arc welding. This is done by expanding the carbon dioxide gas through two stages of pressure reduction. The unit has a preset, one-stage regulator, a heat-exchange coil, a second stage of pressure reduction and a float-type flowmeter. This flowmeter regulator is good for most jobs where the flow and duty cycles are under 80 feet per hour. (Air Reduction Co.)

For more data circle No. 48 on postcard, p. 121


**CUSTOM REBUILDING**

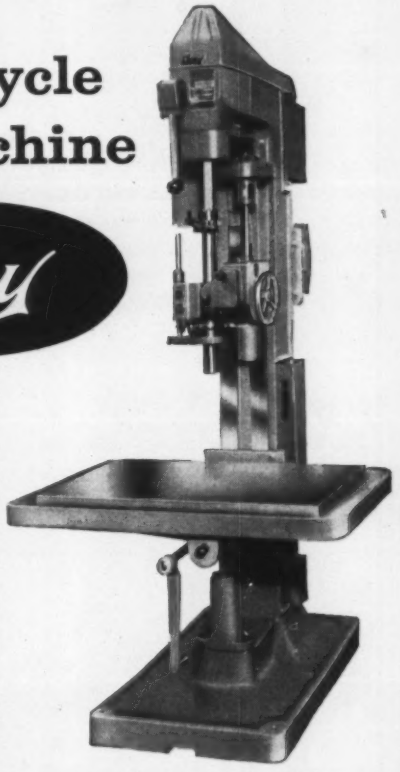
Our engineers work in *your* plant. They determine the least expensive way to modify and modernize your cranes and hoisting equipment. Alter spans. Increase capacity. Convert D.C. to A.C. Install new control systems. A crane rebuilt by Pollock is custom-designed to meet *your* shop requirements.

Pollock Engineering is the nation's foremost redesigner and remanufacturer of heavy-duty cranes. Contact us, outlining your requirements.

**POLLOCK**
**ENGINEERING CO., INC.**
POTTSTOWN, PENNSYLVANIA

**automatic cycle drilling machine**

Avey



You can chop your time costs with automatic set-ups on this new Avey machine, and still take advantage of the low cost and flexibility of a standard unit. Adjustable rapid power traverse, feed, and rapid return of the spindle permit automatic transfer or rotary index fixturing. You also get adjustable feeds, speeds, table travel, head travel, and Avey's precision spindle. Morse Taper 2, 3, or 4; single or multiple spindles 1 to 5 hp. *Write or phone for data.* Avey, Box 1264, Cincinnati 1, Ohio.

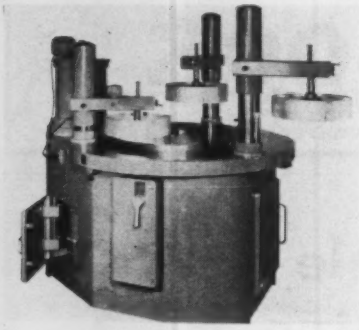
# Previews Point Up Highlights Of Tool Engineers Show

**Watch for these displays as you walk through the aisles of the coming ASTME Tool Show.**

**By checking the latest in tooling methods and equipment, you can meet competition.**

## Laps Piece Parts

With newly designed pneumatic lifts, a flat-lapping machine offers micro-in. precision in lapping and finishing piece parts on a volume

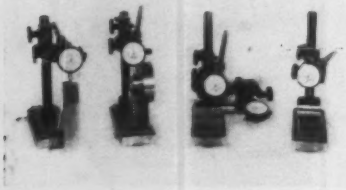


basis. The new lifts eliminate awkward holding devices and magnets. Furthermore, they automatically apply the correct pressure for lapping a wide variety of materials. (Spitfire Tool & Machine Co., Booth 1529)

For more data circle No. 51 on postcard, p. 121

## Versatile Test Gage

The uses of an unusual new test gage are limited only by the ingenuity of the methods engineering

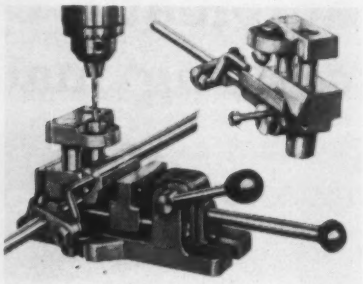


department. It serves as a small comparator anywhere in the shop. Or, it gives production men a fast, precise check on part quality. One simple adjustment positions the column. Then, the indicator adjusts to any height on this column. This allows the arm that carries the indicator to extend to any length within its range, at any angle in the vertical plane. (Dorsey Gage Co., Booth 3814)

For more data circle No. 52 on postcard, p. 121

## Drill Jig Attachment

Designed for the company's line of vises, an attachment converts them to fast-action, adjustable drill jigs. The new unit attaches to the stationary vise jaw, in place of the removable jaw insert. Just an easy press on the locking lever exerts force against the jig plunger. This, in turn, pulls the clamping plate down against the workpiece. Flick

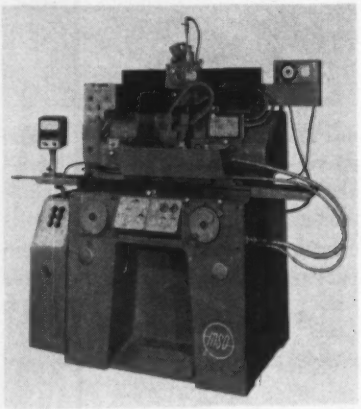


the lever to the vertical position, and the part comes out. The converted vise can be locked and unlocked with one hand. This leaves the other hand free to load and unload. (Heinrich Tools, Inc., Booth 1227)

For more data circle No. 53 on postcard, p. 121

## Cylindrical Grinder

In addition to manual operation, an electro-hydraulic cylindrical grinder provides automatic cycling. It features an advanced servo-control unit. The combination of servo motors and magnetic valves, controlled by potentiometers, results in precise setting of table and wheelhead feed rates. For maximum simplicity and speed, all motions

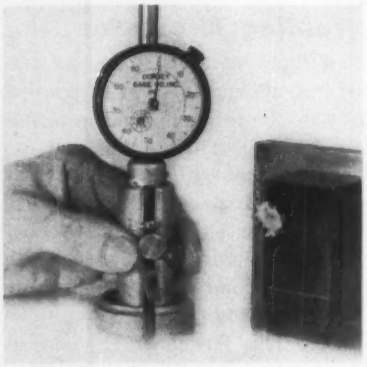


involved in the grinding cycle are dialed in on the control panel, located in front of the machine. (Austin Industrial Corp., Booth 1205)

For more data circle No. 54 on postcard, p. 121

## Scribes Measurements

This simple, easy-to-set device is the only one of its type. It's a scribe gage, for use in the tool room by machinists and toolmakers. The principle involved is the use of a 0.001 indicator to set a scribing



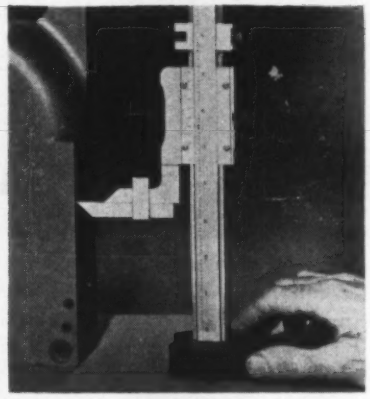
mechanism in a matter of seconds. It gives the operator finger-tip control to adjust the gage to the precise

0.001 reading anywhere within a 1-in. range. This is done with the thumb screw on the side. Calibrations show the closest 0.100 setting. This is verified with an indicator that shows the precise setting on the dial. Once the setting is established, a secure device locks it in. Then, the operator scribes the measurement from the surface plate onto the part. (Dorsey Gage Co., Booth 3814)

For more data circle No. 55 on postcard, p. 121

## Vernier Height Gage

Among the important new additions to a line of measuring tools is a new series of vernier height gages. The newcomers combine correct balance and weight for easy handling in applications where a light-weight gage is preferred. They are available in 12-in. and 18-in. sizes. A long, 50-division vernier, with widely-spaced, easy-to-read



graduations, simplifies setting and reading without the aid of a magnifying glass. Open-face design also means half as many bar graduations; a further aid to easy, accurate reading. (The L. S. Starrett Co., Booth 1214)

For more data circle No. 56 on postcard, p. 121

## Copying Lathe

The optional tracing unit is built into the rear of a new 12-in. toolroom and copying lathe. Thus, normal lathe operation suffers no interference. You can turn the required template, then lock in the copying unit for immediate quantity reproduction of the part. The lathes come in two models, with either 24 in. or 40 in. between centers. One

14" HIGH

NEW!

HIGHEST-RATED, LOWEST-PRICED ($11.95 RETAIL)
2½ LB. DRY CHEMICAL EXTINGUISHER

Now — thanks to the new Kidde Kompact — here's high-power fire protection at a rock-bottom price! Highest-rated, lowest-priced 2½ lb. dry chemical extinguisher on the market, the new pressurized Kidde Kompact packs as much fire-killing power as extinguishers costing twice the price. Equal to eight one-quart carbon tet units, the new Kidde Kompact mounts snugly, works simply — just lift the handle and press the lever.

And . . . there's no recharging needed. Just unscrew the used cylinder, replace with another, only $3.95. At the low, low price of just $11.95, no one should be without a Kidde Kompact. U.L. and U.S.C.G.-approved. For more information, see your dealer or write Kidde today!

Kidde

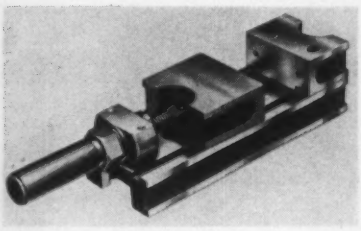
Industrial and Marine Division
Walter Kidde & Company, Inc., 449 B Main Street, Belleville 9, N. J.
Walter Kidde & Company of Canada Ltd., Montreal—Toronto—Vancouver

unusual feature is totally-enclosed end gearing, operating in an oil bath. This not only prolongs gear life, but also lowers the noise level. (REM Sales, Inc., a subsidiary of Robert E. Morris Co., Booth 1436)

For more data circle No. 57 on postcard, p. 121

## Grinding Vise

Want to grind square in two planes, without removing the part from the vise? Simply turn this new



vise on its side. It's accurate, strongly-constructed and economy-priced. Some other advantages are: Vise disassembles quickly; all components can be ground simultaneously; has an excessive-torque shear pin in the handle mechanism; adjusts for wear on movable jaw. The unit is 14½-in. overall, 3-in. high, 3½-in. wide, and weighs 19 lb. (The Producto Machine Co., Booth 2450)

For more data circle No. 58 on postcard, p. 121

## Epoxy Paste in Tubes

Packaged in tubes, a fast-curing, epoxy-paste material has carvability, dimensional stability and easy workability. It is widely used as a quick, effective method for building and duplicating male and female

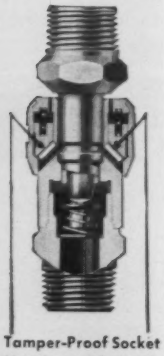
parts; or, as a repair or rebuilding material. The new tube containers stop waste and facilitate use where small amounts are needed. They're ideal for use on the model or pattern maker's workbench. No weighing is necessary. Ribbons of resin and hardener are squeezed out, mixed and applied. Small quantities mix quickly, and there is no chance for error in the resin-hardener ratio. (REN Plastics, Inc., Booth 3606)

For more data circle No. 59 on postcard, p. 121

## Drilling-Tapping Head

Among the new products at the show is a light-duty, compact, adjustable drilling and tapping head. The new head is a gear-driven, double-eccentric type. It comes with 2-6 spindles. The minimum center distance on the 2-spindle head is ⅝-in., with a 1-in. minimum for the 4-spindle unit. The unit is designed for use on bench-type drill presses

*Wherever you have fluid line connections...*



Tamper-Proof Socket Head — with leak-proof, minimum wear, locking device.

—AS EASY AS PLUGGING IN YOUR ELECTRIC SHAVER

- Quick connection and disconnection — as easy as plugging in your electric shaver.
- Instant automatic flow or shut-off.
- Factory assembled socket head cannot be readily damaged — or have component parts lost by casual tampering.
- Locking pins afford large area contact with Plug — reduces wear to a minimum.

*Write for the Hansen Catalog*

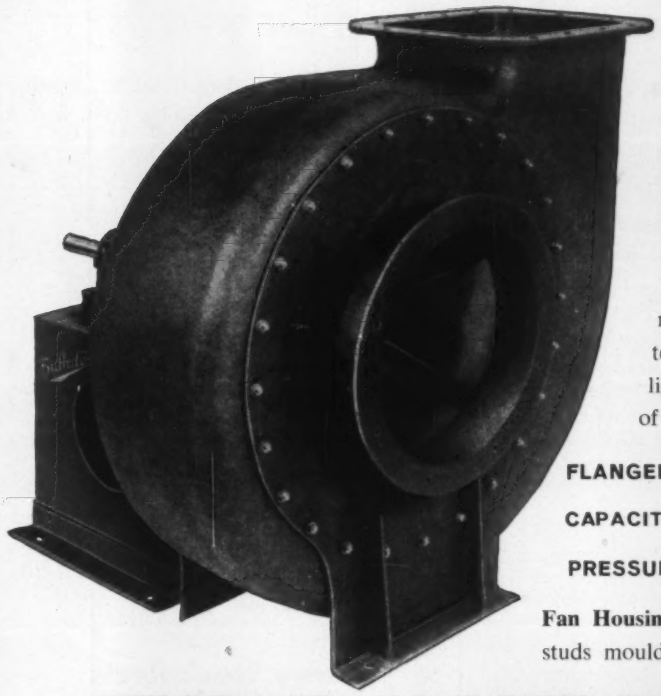
Here is an always ready reference when you want information on couplings in a hurry. Lists complete range of sizes and types of Hansen One-Way Shut-Off, Two-Way Shut-Off, and Straight-Through Couplings.

*Representatives in Principal Cities... See Yellow Pages*

SINCE 1915 — QUICK-CONNECTIVE FLUID LINE COUPLINGS

THE HANSEN MANUFACTURING COMPANY

4031 WEST 150th STREET • CLEVELAND 35, OHIO



## A BUFFALO RESIN-BONDED FIBER GLASS FAN MAY BE YOUR ECONOMICAL ANSWER

Excellent chemical resistance to a wide range of acids, salts, gases, organic materials and other corrosives — strength and resilience — ability to stand temperatures up to 300°F. with special resins — and light weight are some of the desirable characteristics of the 'Buffalo' Type FG Fan.

**FLANGED INLET AND OUTLET**—for gas-tight connections.

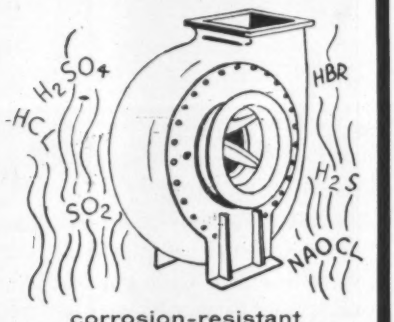
**CAPACITIES** — up to 34,000 cfm.

**PRESSURES** — up to 10″ static.

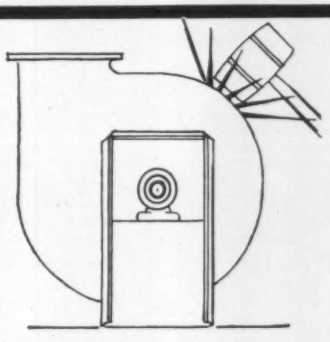
**Fan Housing** — resin-bonded fiber glass with stainless steel studs moulded-in for mounting to the bearing stand flange. Efficient scroll shape.

**Rotor**—husky steel wheel completely encased in resin-bonded fiber glass. Factory-balanced, statically and dynamically, for vibrationless performance.

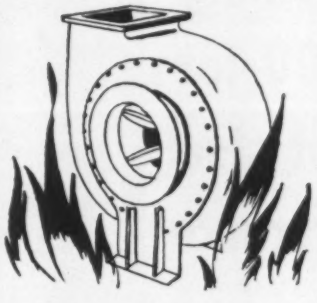
# FUME-HANDLING PROBLEM?




corrosion-resistant



impact-resistant



won't support combustion

**WRITE FOR BULLETIN FI-511** for all details and chemical resistance table.

"Buffalo"

**BUFFALO FORGE COMPANY**

Buffalo, New York

Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

*Buffalo air handling equipment to move, heat, cool, dehumidify and clean air and other gases.*

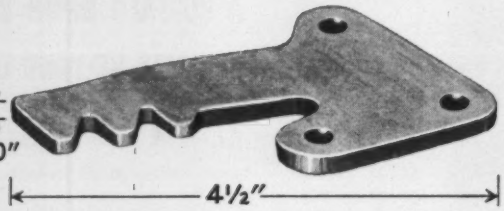
*Buffalo Machine Tools to drill, punch, shear, bend, slit, notch and cope for production or plant maintenance.*

*Buffalo Centrifugal Pumps to handle most liquids and slurries under a variety of conditions.*

*Squier machinery to process sugar cane, coffee and rice. Special processing machinery for chemicals.*

# 300,000 Blanks Stamped Between Regrinds . . .

**"TRI-TUNG" Die Still Operating After 1,200,000 Stampings!**




How would you like to stamp 300,000 parts like this, between regrinds? That's the kind of tool life reported by Ferro Stamping Co., Detroit, Mich., with Uddeholm's Fine Swedish Tool Steel.

These auto-door striker-plates were stamped from .190" Hot Rolled AISI 1010 steel plate, using Uddeholm "TRI-TUNG" (SAE D-6) for the four stage progressive die. "TRI-TUNG" is an Air Hardening High-Carbon, High-Chromium Swedish Tool Steel with excellent wear-resistant qualities.

To date, the "TRI-TUNG" die has produced 1,200,000 stampings . . . and is still going strong! This represents a 50% increase in die life compared with other High-Carbon, High-Chromium Steels. This results in considerably lower manufacturing and maintenance costs, — substantial cuts in down-time and reduced costs per piece.

**Write for technical information and stocklist on any grade, size and type of Tool Steel you require.**

UDDEHOLM CO. OF AMERICA

UHB TOOL & DIE STEELS COLD ROLLED SPRING STEELS

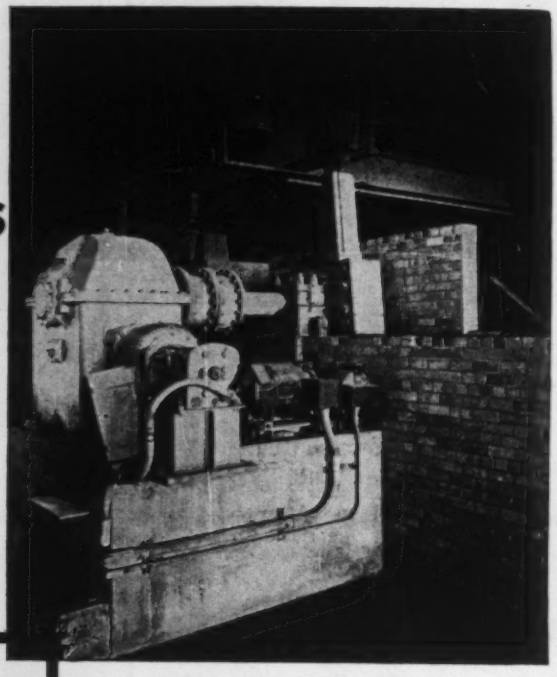
155 East 44th St., New York 17, N. Y., MUrray Hill 7-4575

*Uddeholm Steels—used by American Industry since 1820*

Branch Offices & Warehouses — Chicago, Ill. — Cleveland, O. — Detroit, Mich. — Los Angeles, Calif. — Newington, Conn. — Philadelphia, Pa. — In Canada — Uddeholm (Canada) Ltd., Montreal — Toronto



# Tilting 700-tons of steel furnace



**CONE-DRIVE GEARS**

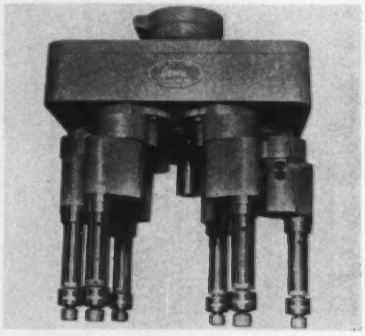
DIVISION MICHIGAN TOOL CO.
7171 E. McNichols Rd., Detroit 12

Here's a closeup of tilting mechanism for an electric furnace. Standard, stock model, double-reduction Cone-Drive **double-enveloping worm** gear speed reducer tilts furnace and heat with combined weight of 700 tons.

Powerful Cone-Drive gearing is available in gearsets, speed reducers and gearmotors.


## SHOW PREVIEWS

as well as floor models. Another new item, added to the other end of the tapping-head line, is a heavy-

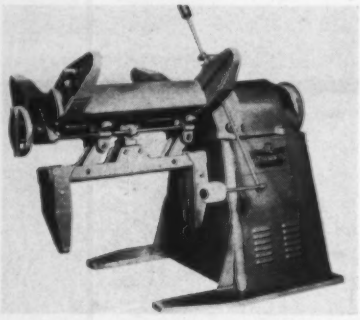


duty, adjustable head of the same basic design. It has a 1-in. diam drill capacity; 2-6 spindles. (Jarvis Corp., Booth 1322)

**For more data circle No. 60 on postcard, p. 121**

### Large Stock Reels

Heavy-duty coil-stock reels, up to 2500-lb capacity, supply the stock to presses and accessory-feeding equipment in a smooth, even flow. The units are power driven and can be synchronized to other equipment by means of a mercury switch.



They're equipped with electric, disk-type brakes that are long lasting and smooth acting. Coils automatically center and balance for easy unwinding. Keeper adjustments permit fast stock loading. The reels come in 3 sizes for 12-, 18- and 29-in. stock width sizes. (Cooper Weymouth, Inc., Booth 1239)

**For more data circle No. 61 on postcard, p. 121**

### Balances Rotors

Now, balance rotors, flywheels or any other rotative parts up to 200 lb. in weight, with an electronic, single-plane balancer. There is an

inverse relationship between weight and diametral capacity. For example: When weight is 50 lb or less, maximum diametral capacity is 30 in.; when weight is 200 lb, maximum, diametrical capacity is 13 in. The device employes a strobe light and other operating principles found

in the company's cradle-type and portable industrial balancers. However, it's simpler and faster to operate than cradle-type devices. This makes production balancing economically feasible for many new types of production. (Stewart-Warner Corp., Booth 3917)

For more data circle No. 62 on postcard, p. 121

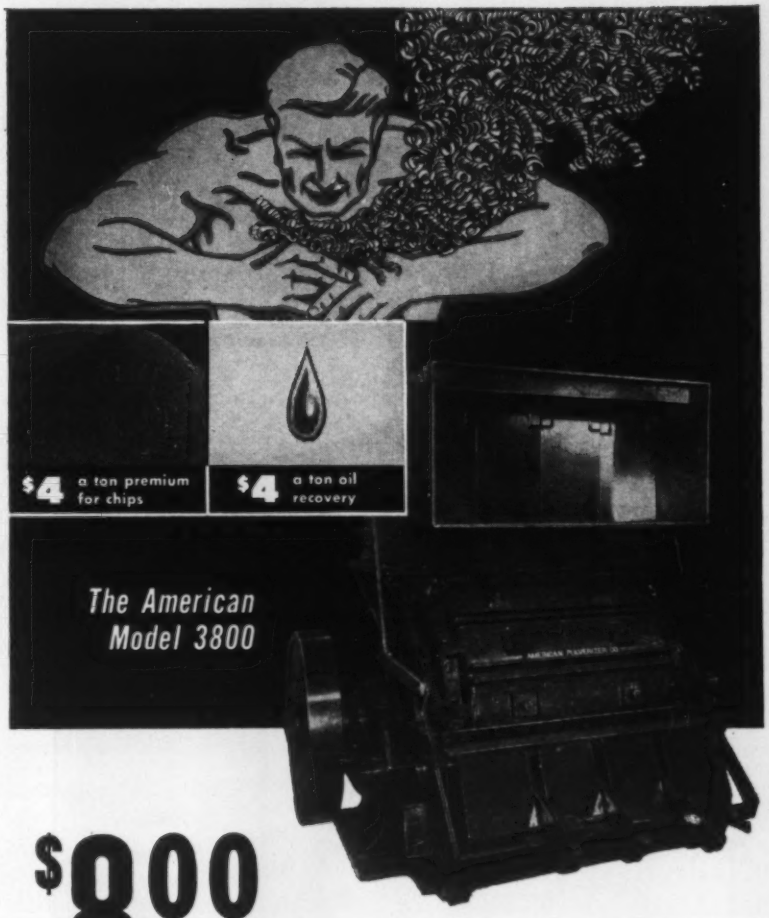
## High Speed Presses

Available in sizes ranging from 5-150 tons, a line of presses delivers strokes of four different lengths. This makes for a much wider work range. The units also feature a newly-designed gap frame. In addition, there's an air-clutch mechanism that reduces wear on the crankshaft. The line conforms to Joint Industry Conference specifications. (Dechert Dynamics Corp., Booth 3801)

For more data circle No. 63 on postcard, p. 121

## Taps Accurate Holes

Featuring adaptability and freedom of action, a new hand-tapping machine also speeds the work. The operator can instantly swing the tap to any position on the table. For accuracy, a floating arm guides the tap into the true hole center. There's


$800 MORE PER TON FROM TURNINGS

American Rolling Ring Metal Turnings Crushers quickly pay for themselves. Savings of approximately $4.00 per ton through extra cutting-oil recovery from crushed turnings often pay for the crusher in a short time. In addition, uniform chips command a higher price (up to $4 more per ton). Add to this the valuable savings in storage space (up to 75% less), the easier handling, the heavier car loadings possible, and you have tremendous profit advantages with the American Crusher working in your plant.

If your turnings amount to 20 tons or more a month, there's an American Crusher designed to pay off big for you.

*American has manufactured Turnings Crushers since 1917 and makes a wide range of models with capacities from 1 ton to 50 tph.*

**Write for Bulletin #159.**

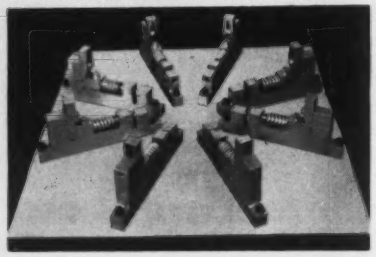
American PULVERIZER COMPANY
ORIGINATORS AND MANUFACTURERS OF RING CRUSHERS AND PULVERIZERS
1439 MACKLIND AVE. ST. LOUIS 10, MISSOURI
6103

no pushing or tugging. (Toolroom Equipment Div., The Producto Machine Co., Booth 2450)

**For more data circle No. 64 on postcard, p. 121**

## Punches Holes

These new hole-punching units punch round and shaped holes in flanges of angles and other formed parts. The punch travels horizontally and the button-type, die-stripper spring, lifter spring, and guide

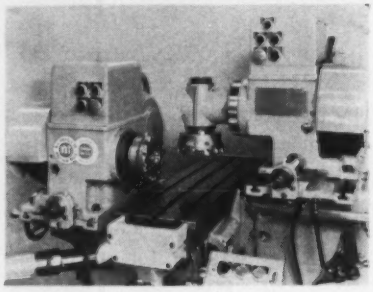


are located in a horizontal position in the holder. Punches, dies, guides and springs are the same as the standard, low-cost parts used in the company's well-known punchers which operate in the conventional vertical direction. Nothing is attached to the press ram. The holder, of these completely self-contained units, perfectly aligns the punches and dies. (Punch Products Corp., Booth 1532)

**For more data circle No. 65 on postcard, p. 121**

## Twin-Head Miller

With both horizontal and vertical milling heads, a new milling machine does precise face milling of two, right-angle surfaces at one pass. The table cycle is automatic. The machines boast several features including a mist-coolant system;

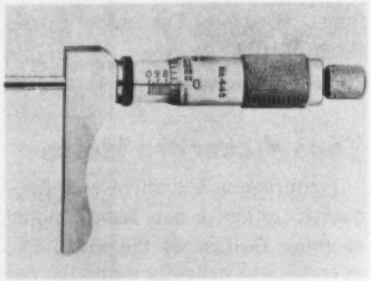


arbor-mounted cutting arrangements with outboard-arbor support; air-actuated holding fixture; automatic rough-and finish-milling cycles; and other advanced improvements. (REM Sales, Inc., distributor for W. H. Nichols Co., Booth 1436)

**For more data circle No. 66 on postcard, p. 121**

## Half-Base Depth Gages

On display at the show will be a new series of micrometer depth gages featuring a short half base. This design facilitates measuring



depths of holes and slots located close to shoulders or between obstructions where full-base gages will


NON-FLUID OIL
TRADE MARK REGISTERED

KEEPS AIR TOOLS WORKING EFFICIENTLY

Ordinary Oil Separates from Water

NON-FLUID OIL
TRADE MARK REGISTERED
Emulsifies with Water

Leading pneumatic tool manufacturers use and recommend "NR" grades of NON-FLUID OIL because they know such use insures trouble-free lubrication while automatically protecting tools against rusting, sticking and excessive wear. Unlike ordinary oils and greases, "NR" grades of NON-FLUID OIL absorb ever-present moisture into the lubricant, assuring perfect lubrication and complete protection of the pneumatic tool despite air moisture content.

"NR" grades of NON-FLUID OIL will increase the efficiency and life-span of your air tools.

Ask for a free sample and Bulletin No. 550. Then make this simple test to prove how "NR" will improve tool performance.

Take an air tool which is back in the tool crib because of lack of power, fill the back-end of the tool with "NR" replace the air line—and within a few seconds you will feel and hear the tool pick up speed and power. When "NR" is used regularly, tools remain at top speed and power, and stay in service without chronic tool-crib maintenance.

**Warehouses**

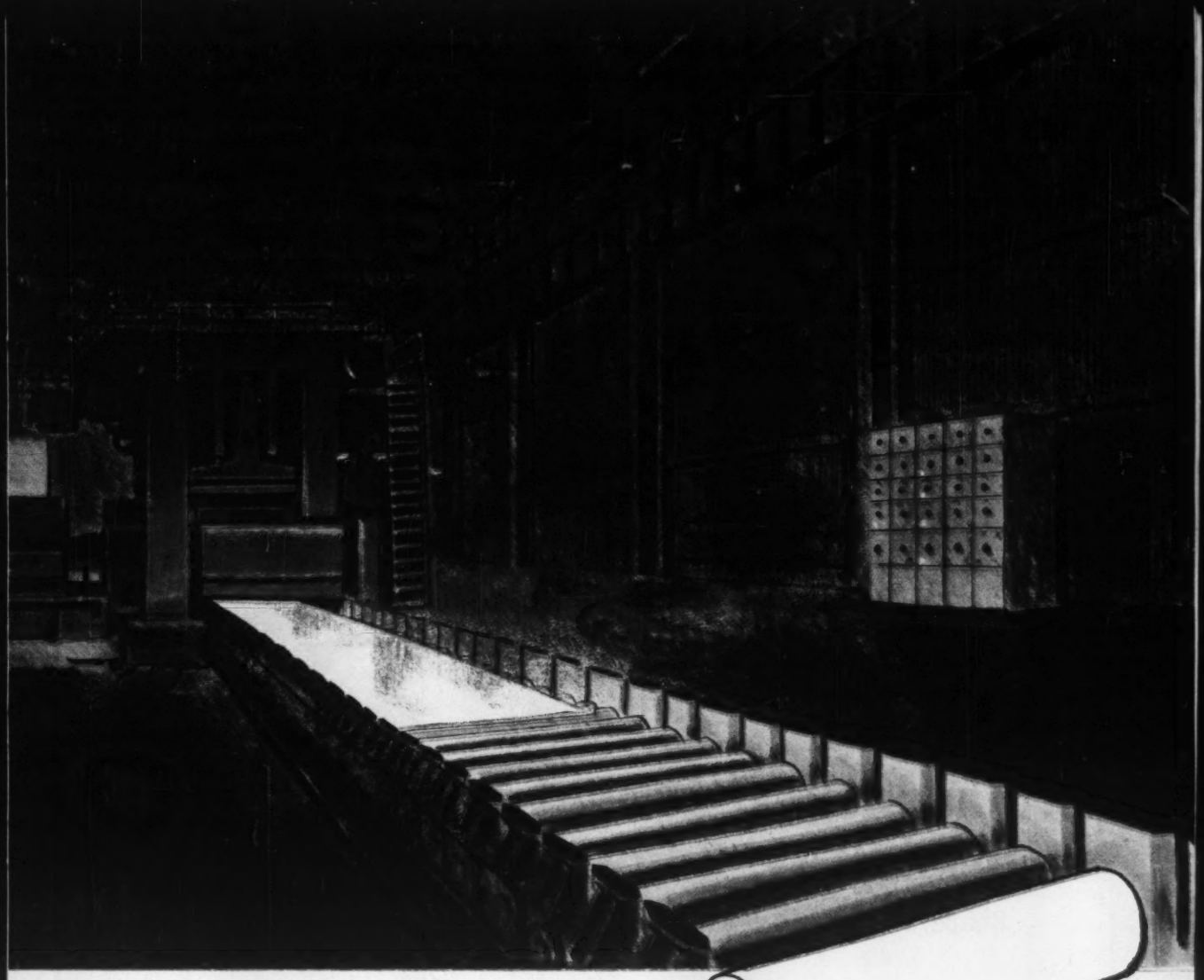
Birmingham, Ala. — Chicago, Ill.
Atlanta, Ga. — Greensboro, N.C.
Columbus, Ga. — Detroit, Mich.
Charlotte, N.C. — Providence, R.I.
Greenville, S.C. — St. Louis, Mo.

Also represented in principal industrial centers, including Pittsburgh, Pa., Cleveland and Cincinnati, Ohio.

65 YEARS 1896 1961

NEW YORK & NEW JERSEY LUBRICANT COMPANY
292 Madison Ave., New York 17, N.Y.
WORKS: NEWARK, N.J.

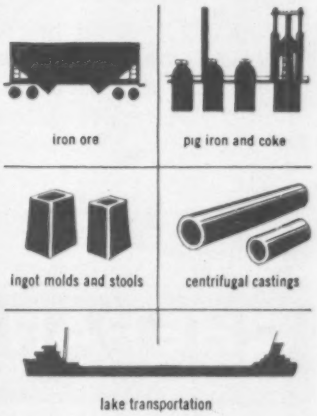
NON-FLUID OIL is not the name of a general class of lubricants, but is a specific product of our manufacture. So called grease imitations of NON-FLUID OIL often prove dangerous and costly to use.



# Rolls can take a beating when they are centrifugally cast by Shenango

Not only steel mill run-out table rolls as illustrated here, but glass making rolls, paper mill rolls, aluminum forming rolls and many others stand up longer and need to be redressed less frequently if they are centrifugally cast by Shenango. Ferrous or non-ferrous casting by spinning means cleaner, denser grain structure with no blow-holes or inclusions. And because Shenango operates one of the best staffed and most extensive modern centrifugal foundries and machine shops in the country, your largest orders will be filled with accuracy and dispatch.

## THIS IS SHENANGO!

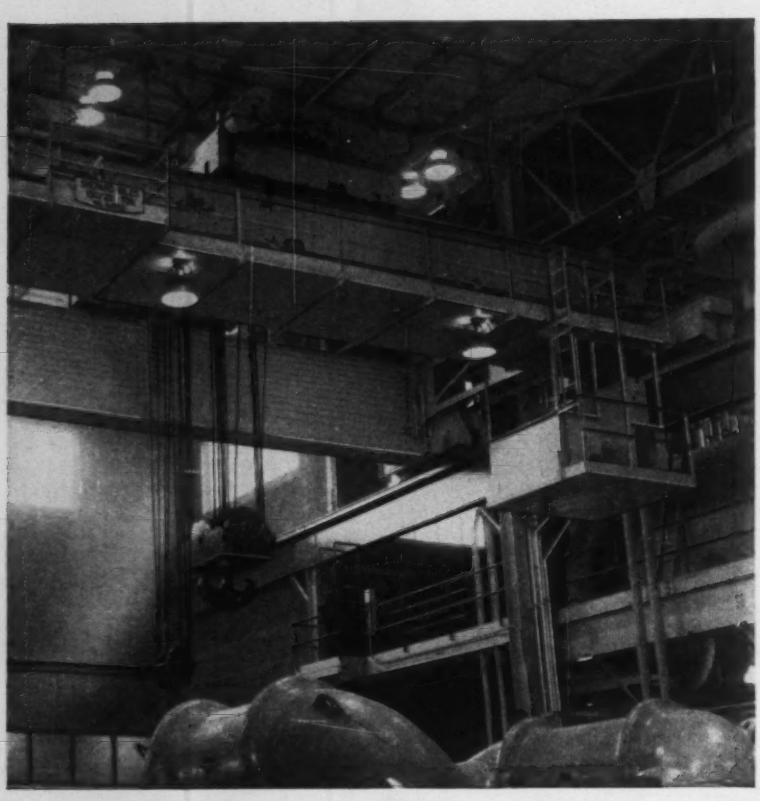



CENTRIFUGAL CASTING DIVISION

the Shenango FURNACE COMPANY

DOVER, OHIO

Copper, Tin, Lead, Zinc Bronzes • Aluminum and Manganese Bronzes • Monel Metal • Ni-Resist • Meehanite® Metal • Ductile Iron



# Permanent Investment In Profitable Load-Moving

## Shepard Niles JOB-MATED Cranes

Shepard Niles JOB-MATED Cranes, with auxiliary hoists, are not merely handling devices, but versatile, highly engineered machine tools that contribute directly to increased production and profits.

Even in our "standard" cranes, our use of Shepard Niles-designed and -built components results in your receiving a custom-built crane to meet your exact on-the-job conditions. Care like this in our plant means lower operating costs and increased efficiency in yours.

For the full story on how Shepard Niles JOB-MATED QUALITY Cranes (from 250-lb. to 500-ton capacities) will cut costs in your operation, write and ask to have a Shepard Niles representative call at your convenience. And send for our descriptive bulletin.

Member of Electric Overhead Crane Institute

America's Most Complete Line of Cranes and Hoists

SHEPARD NILES
CRANE AND HOIST CORPORATION

1472 Schuyler Ave., Montour Falls, N.Y.

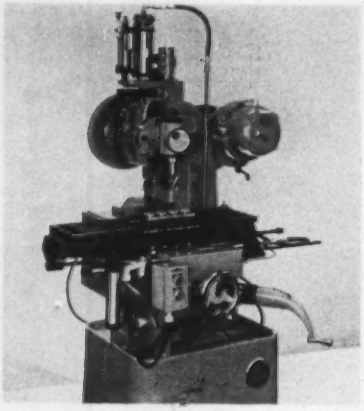


not go. Graduated to read in thousandths of an inch, the half-base depth micrometers come in three size ranges: 0-3 in., 0-6 in. and 0-9 in. (The L. S. Starrett Co., Booth 1214)

For more data circle No. 67 on postcard, p. 121

## Semi-Automatic Mill

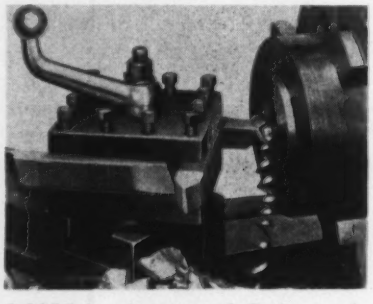
New, semi-automatic production millers feature automatic rise and fall spindle cycle and an automatic table feed. They'll be on display at the show. A skip milling demonstration will show how widely-separated surfaces can be milled at one setting, with rapid traverse between cutting positions to avoid "milling air." The machines come in two sizes, with a variety of spindle motions that are synchronized with the automatic-table movements. (REM Sales, Inc., distributor for W. H. Nichols Co., Booth 1436)



For more data circle No. 68 on postcard, p. 121

## Turret Attachments

New turret toolposts have guaranteed re-indexing accuracy to 0.0005 in. A patented O-ring seal, incorporated into the toolposts,



keeps dust and chips from getting up into the indexing mechanism. The units fit practically all bench lathes, engine lathes, turret lathes and screw machines. (Enco Mfg. Co., Booth 3834)

**For more data circle No. 69 on postcard, p. 121**

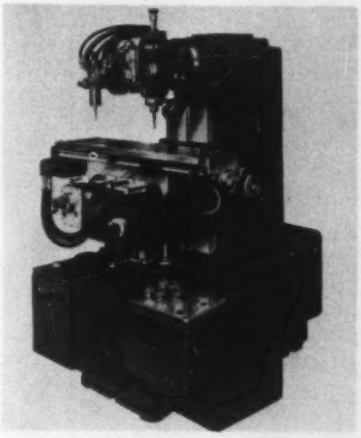
## Magnetic Chucks

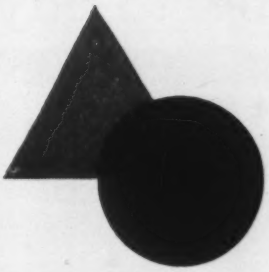
Electricity turns on these new magnetic chucks that hold large ferrous workpieces. But, once the chuck is electrically energized, permanent magnets take over and provide the holding power during machining operations. There are two outstanding benefits with this system. First, it eliminates distortion due to thermal expansion. Secondly, there's no danger from power failure. (O. S. Walker Co., Booth 2418)

**For more data circle No. 70 on postcard, p. 121**

## British-Built Machines

Several British-built, precision machine tools will be on exhibit at the New York Coliseum. The following machines will be demonstrated in operation: Cylindrical Grinder, facing and thread cutting machine, gear planer, ram-type turret lathe, fully-automatic, copy-die-sinking machine, radial drill, horizontal boring machine. In addition to these seven machines, there's a scale-model of a single-upright, vertical boring and turning mill. Some of the machines have a displaceable table. This permits machining of a part twice the diameter



An important source for North American high-speed and specialty steels

ATLAS STEELS



THE AMPLEXOLOGIST

dreams up a gear train

The Amplexologist designed this gear train (plus ten other parts) especially for powder metal production—at the request of a manufacturer who called him in at the design stage. All (except the helical gear) are finished precision parts which require only shaving. Estimated savings; 86%. Sound interesting? Call the Amplexologist.

AMPLEX

DIVISION CHRYSLER CORPORATION DETROIT 31, MICHIGAN

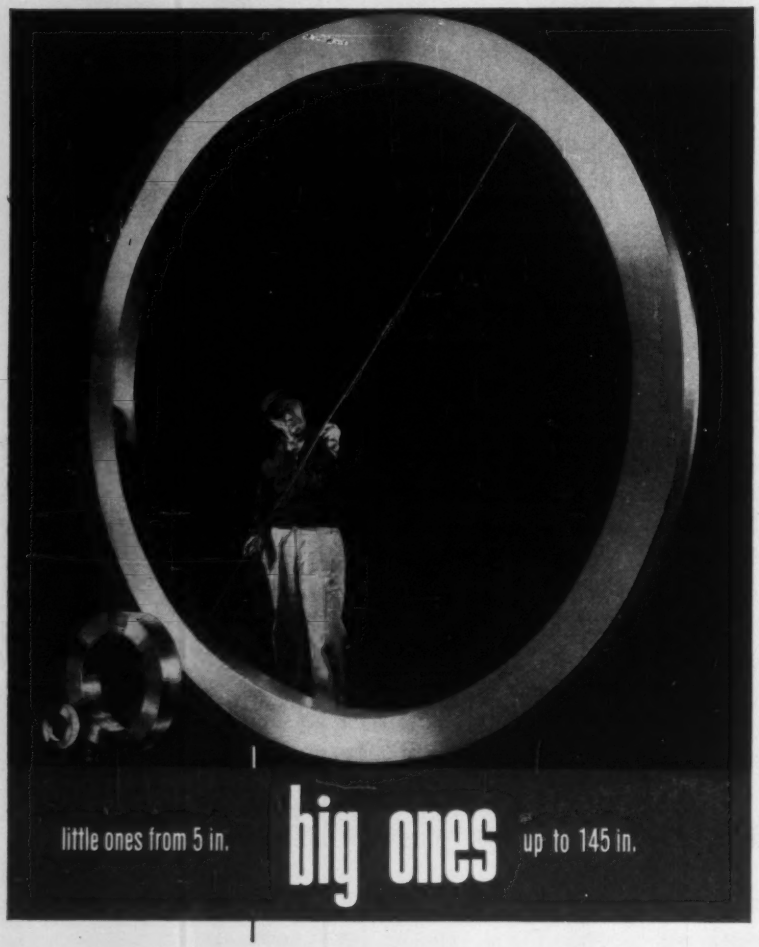
OILITE

*SEND FOR THE SECRET OF THE AMPLEXOLOGIST'S SUCCESS*

1 ENGINEERING MANUAL
45 pages of technical information: How to determine correct applications for powder metal parts, bearings, filters.

2 NEW BEARING STOCK LIST
20 pages. 1066 standard sizes of Oilite self-lubricating bearings—bearing material. Selection guide, engineering data.

# How to buy steel rings . . .




**consult with experienced maker**

Find out about his background . . . experience . . . manufacturing facilities . . . how close he can come to meeting your specifications . . . what engineering assistance he can provide.

**put your plans in his hands**

When you have found this experienced, reliable supplier, send him your drawings. Give him complete details on materials, shape, tolerances you require, nature of application, and the performance you expect.

**then let him assist you**

If Edgewater is your choice, you will find that we will follow your specifications exactly. If required, we can furnish engineering assistance and suggest the material, shape and size to give you the ultimate in performance and economy.

**want more details?** Write for the Edgewater brochure, which describes our facilities, know-how, and range of sizes and shapes.

**Edgewater Steel Company**

P.O. Box 478 • Dept. IA • Pittsburgh 30, Pa.

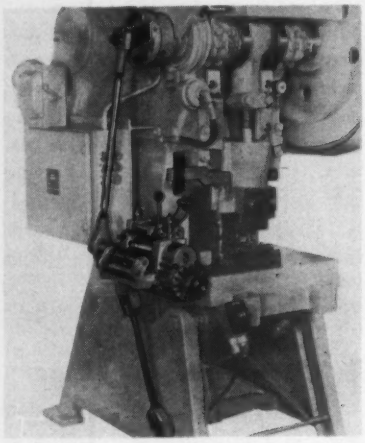



of the table. (Lapointe Machine Co., Booth 1105)

For more data circle No. 71 on postcard, p. 121

## Feeds Coil Stock

Increased stamping-press production is made possible by using roll feeds which automatically feed coil stock at speeds up to 450 press



strokes per minute. Operation is by an eccentric hub from the press crankshaft. One simple adjustment is all that is necessary to change feed lengths. The rollers feature rugged construction, with roller or ball bearings for all rotating parts. The top roll has a reslease and lock-out device. It's automatically reset by the downward movement of the press ram. The roll feeds are made in 15 sizes, with a variety of stock widths from 2-12 in. (Cooper Weymouth, Inc., Booth 1239)

For more data circle No. 72 on postcard, p. 121

## Production Sawing

For best results, team up the blade with the machine in produc-

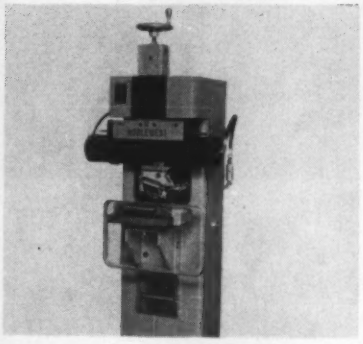
tion cut-off operations. Here's a production saw built to use the re-

markable cutting ability of tungsten carbide. This means exceptional rigidity, a high-pressure cooling system and controlled speed and feed. When it's fitted with a new tungsten-carbide cutting blade, you have a combination that suits heavy-production work on a round the clock basis. Cutting speed is fast—up to 35 sq in. per minute in 1018 cold-rolled steel. (The DoALL Co., Booth 2222)

**For more data circle No. 73 on postcard, p. 121**

## Marking Machine

Applying all-pneumatic operation to general purpose marking, a new machine has all operating mechanisms in its compact head. This head is comparable to an air or hydraulic press, in that it supplies both the marking pressure and the horizontal die travel for roll marking. Air pressure controls depth of mark and insures uniformity of impression depth. It does this for each work piece, regardless of variations in the work thickness. The machine comes with all necessary air controls, including pressure regulator, filter, lubricator and gage. (Noble & Westbrook Mfg. Co., Booth 3130)



**For more data circle No. 74 on postcard, p. 121**

## Steel-Bonded Carbide

Steel-bonded carbide blanks offer an unusual combination of desirable properties. They retain the best qualities of the constituent elements: Titanium-carbide's ultra hardness and steel's machinability. The blanks depend on a tool-steel matrix to achieve a heat-treatable and wear-resistant product. Crystals of titanium-carbide are embedded in the relatively-soft matrix of stain-

**Traveling fume hood follows the ladle...**

for leaded steel production

AT JONES & LAUGHLIN STEEL CORP.

Toxic lead oxide fumes, inherent to the leaded steel manufacturing process, are now controlled effectively with a traveling hood car system (1), developed by KIRK & BLUM.

Orifice of exhaust system is just inches away from the pouring action (2). Toxic gas, formed in the ingot mold, is baffled by the ladle bottom, (3), to assist positive horizontal cross-flow at high velocity over the top of the molds.

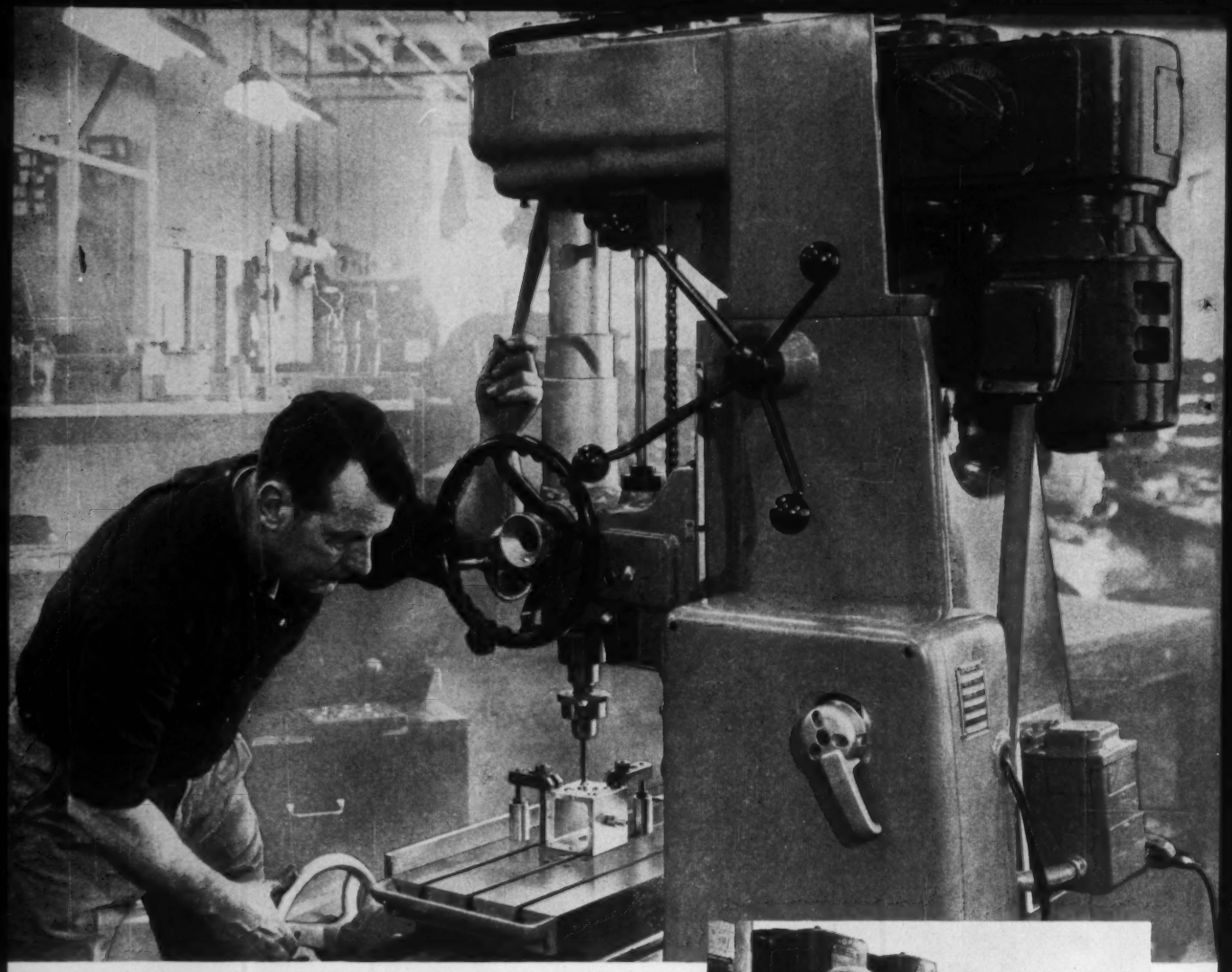
The hood connects to a slotted exhaust manifold, (4), equipped with flexible sealing surfaces. Synchronized with the ladle crane, the car indexes freely along the pouring platform, opening the flexible sealing surfaces only at the point of contact to produce suction through the intake orifice for fume removal in the area of pouring.

This unique design is a product of KIRK & BLUM engineering ingenuity. Put this know-how to work for you. For further details or a no-obligation fume control survey, write: The Kirk & Blum Manufacturing Co. 3200 Forrer Street, Cincinnati 9, Ohio.

KIRK & BLUM.
DUST AND FUME CONTROL

50 YEARS OF SERVICE TO INDUSTRY

Pittsburgh, Pa. Distributor
The Bushnell Machinery Co., 3015 West Liberty Avenue



Mr. A. A. Lindberg, Design Engineer,
Moore Special Tool Co., Inc. states:
**"On our Model 1½ Jig Borer...**

# General Electric Polydyne® Drives Help Us Maintain 0.000070"* Accuracy"

"Efficient control of vibration is the reason that the majority of our Model 1½ jig borers are equipped with General Electric Polydyne drives. Competitive drives have never fully solved this problem," states A. A. Lindberg, Design Engineer for Moore Special Tool Co., Bridgeport, Connecticut.

"Moore tests each Polydyne drive on a specially constructed bracket," continued Mr. Lindberg. "Vibration readings are taken at three points, and every Polydyne drive tested has been under the vibration limit of 0.001 inch and virtually free of operating noise.

"Another reason that our Model 1½ has proved popular is that the Polydyne drive gives an infinite number of operating speeds with just a simple adjustment of the dial to the desired rate."

When your application requires low-cost adjustable speed combined with reliability and ease of maintenance, investigate G-E Polydyne drives. Your General Electric Sales Engineer has full details. Or, write for bulletin GEA-6806, Section 854-06, General Electric Company, Schenectady 5, N. Y.

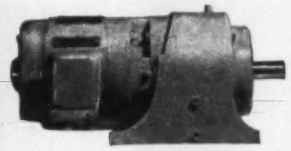
* Seventy Millionths

GENERAL ELECTRIC

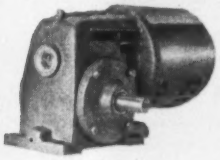
**GENERAL ELECTRIC OFFERS A *COMPLETE* LINE OF LOW-SPEED DRIVES 1/8 TO 200 HP**

**Select from G.E.'s PLUS LINE of compact mechanical power transmission equipment! A full range of ratings is available—many directly from stock.**

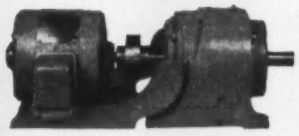
General Electric Polydyne Drive



Integral-type Gear Motor

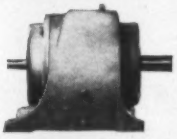


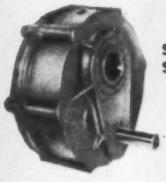
Right-angle Shaft Gear Motor



All-motor Gear Motor

Footed Speed Reducer





Shaft-mounted Speed Reducer

Member of
American Gear Manufacturers' Association

GENERAL ELECTRIC

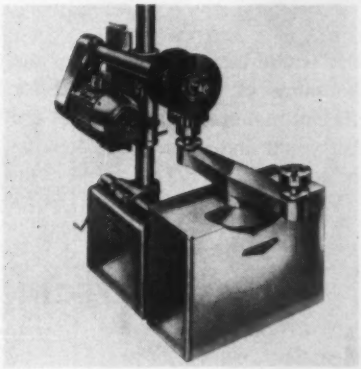
## SHOW PREVIEWS

less or tool steel, then sintered. This yields a blank that's workable with conventional machine tools. (Sintercast Div., Chromalloy Corp., Booth 3901)

For more data circle No. 75 on postcard, p. 121

### Finishing Machine

A new finishing machine, for high-production deburring, also performs edge blending, surface cleaning and polishing and buffing operations. The finisher consists of a 2-spindle indexing workholder, and

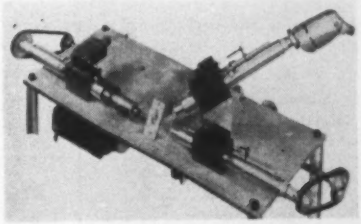


one universal finishing-wheel head. Simplicity of design makes the machine ideal for job shopping of continuous-production runs. The 2-spindle workholder promotes inexpensive fixturing. During high-production runs, the operator performs the unload and load operation on one spindle. At the same time, the other spindle deburrs or finishes the gear or part. The Osborn Mfg. Co., Booth 2407)

For more data circle No. 76 on postcard, p. 121

### Production Tools

On display at the show is one of the most complete lines of multiple

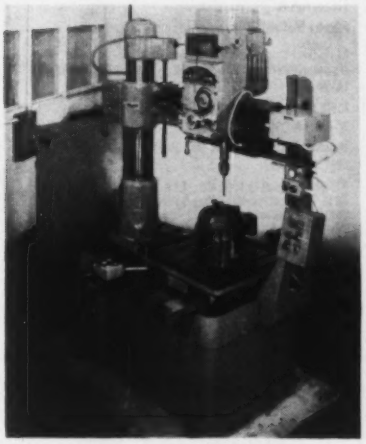


drilling, tapping, and related production tools in the industry. Seven models of a multiple drill, and various tapping units will be shown and demonstrated. In addition, a number of new angle-drill units will be arranged in a multiple-drilling setup to illustrate the use of the unit in difficult off-line drilling operations. To round out the exhibit, a high-speed air-actuated tapper will also be in operation. This unit adapts to automatic or semi-automatic tapping cycles. (Commander Mfg. Co., Booth 3209)

For more data circle No. 77 on postcard, p. 121

### Numerical Control

A numerical control, with a point-to-point, two-axis positioning system, will be shown in operation with a new precision-drilling machine at the show. The drill head, driven on a gantry arm, provides



one of the two axes. The horizontal-table motion supplies the other. (Diehl Mfg. Co., Booth 2135)

For more data circle No. 78 on postcard, p. 121

### Presets Machine Tools

By presetting cutting tools, a precision machine represents another step towards the elimination of machine-tool downtime. It works to the accurate standards demanded by continuously-operating, numerically-controlled machine tools. Just as important to the cost-conscious engineer, it reduces setup time for numercal jobs. (Microbore Div., De-Vlieg Machine Co., Booth 1314)

For more data circle No. 79 on postcard, p. 121

**For Quality and Economy Use**

MALLEABLE

**For Service Contact...**

**CONNECTICUT**
Connecticut Mall. Castings Co., New Haven 6
Eastern Malleable Iron Co., Naugatuck
**DELAWARE**
Eastern Malleable Iron Co., Wilmington 99
**ILLINOIS**
Central Fdry. Div., Gen. Motors, Danville
Chicago Malleable Castings Co., Chicago 43
Moline Iron Works, Moline
Moline Malleable Iron Co., St. Charles
National Mall. and Steel Castings Co., Cicero 50
Peoria Malleable Castings Co., Peoria 1
Wagner Castings Company, Decatur
**INDIANA**
Albion Malleable Iron Company, Muncie Division, Muncie
Link-Belt Company, Indianapolis 6
National Mall. & Steel Castings Co., Indianapolis 22
**IOWA**
Iowa Malleable Iron Co., Fairfield
**MASSACHUSETTS**
Belcher Malleable Iron Co., Easton
**MICHIGAN**
Albion Malleable Iron Co., Albion
Auto Specialties Mfg. Co., Saint Joseph
Cadillac Malleable Iron Co., Cadillac
Central Fdry. Div., Gen. Motors, Saginaw
**MINNESOTA**
Northern Malleable Iron Co., St. Paul 6
**MISSISSIPPI**
Mississippi Malleable Iron Co., Meridian
**NEW HAMPSHIRE**
Laconia Malleable Iron Co., Laconia
**NEW YORK**
Acme Steel & Mall. Iron Works, Buffalo 7
Frazer & Jones Company Division Eastern Malleable Iron Co., Solvay
Oriskany Malleable Iron Co., Inc., Oriskany
Westmoreland Mall. Iron Co., Westmoreland
**OHIO**
American Malleable Castings Co., Marion
Central Fdry. Div., Gen. Motors, Defiance
Dayton Mall. Iron Co., Ironton Div., Ironton
Dayton Mall. Iron Co., Ohio Mall. Div., Columbus 16
National Mall. and Steel Castings Co., Cleveland 6
**PENNSYLVANIA**
Buck Iron Company, Inc., Philadelphia 22
Erie Malleable Iron Co., Erie
Lancaster Malleable Castings Co., Lancaster
Lehigh Foundries Company, Easton
Meadville Malleable Iron Co., Meadville
Pennsylvania Malleable Iron Corp., Lancaster
**TEXAS**
Texas Foundries, Inc., Lufkin
**WEST VIRGINIA**
West Virginia Mall. Iron Co., Point Pleasant
**WISCONSIN**
Belle City Malleable Iron Co., Racine
Chain Belt Company, Milwaukee 1
Federal Malleable Company, Inc., West Allis 14
Kirsh Foundry Inc., Beaver Dam
Lakeside Malleable Castings Co., Racine
Milwaukee Malleable & Grey Iron Works, Milwaukee 46

**These companies are members of the Malleable Castings Council**

ASTME TOOL SHOW

# Tool Experts Meet

**Next month, New York City will play host to the American Society of Tool and Manufacturing Engineers. Conferences and exhibits at the Coliseum will run from May 22-26.**

**Seminars, panels, symposia, "techtours" and technical sessions are scheduled.**

■ If you're interested in any of the thousands of products needed for efficient manufacturing, chances are that you'll find what you're looking for at the ASTME Tool Exposition.

Visitors are encouraged to bring their manufacturing problems to the Exposition. Hundreds of experts on all phases of manufacturing are prepared to demonstrate how these problems can be solved.

More than 50 papers will be presented at the technical sessions. These papers will cover electrolytic metal removal, numerical control, surface metrology and other key subjects.

Here's the Exposition hours: Monday, May 22, 1:00-9:00 pm; Tuesday, May 23, 1:00-9:00 pm; Wednesday, May 24, 9:00 am to 6:00 pm; Thursday, May 25, 9:00 am to 6:00 pm; and Friday, May 26, 9:00 am to 6:00 pm.

## ASTME TECHNICAL PROGRAM

### Monday, May 22

#### Technical Sessions

Recent Tool and Manufacturing Developments, 9:30-11:30 am. "Fiber Optics—New Twists in an Old Science" and "Effect of Catalyst Variations on the Bonding Properties of Epoxy Adhesives."

Operations Research, 2:30-4:30 pm. "Operations Research — Concepts, Techniques and Applications" and "Case Study in Operations Research Manufacturing."

#### Surface Metrology Seminar

Surface Specifications, 9:15-10:30 am. "The Science of Surface Metrology" and "Understanding the Language of Metrology."

Surface Specifications and Measurement, 10:45 am-12:00 pm. "Surface Finish and Other Surface Specifications" and "Controlling Surface Finishes with Interferometers."

Surface Measurement, 2:30-4:30 pm. "The Application of Stylus Inspection Methods in Ball and Bearing Manufacture" and "The Use of Precision Surface Finish Comparison Specimens."

Problem Clinic, 7:30-9:00 pm.

### Tuesday, May 23

#### Technical Sessions

Press Tooling Progress, 9:15-11:15 am. "Increased Application of Stress Designed Rule Tooling in Industry" and "Fabrication of Composite Dies."

Grinding, 9:30-11:30 am. "Those Elusive Millionths" and "A new and Realistic Look at Grinding Wheel Procedures."

Automation and Numerical Control, 2:00-4:00 pm. "The Evolution of the Numerically Controlled Machining Center" and "Economic and Technical Feasibility Analyses for Automation."

#### Surface Metrology Seminar

Surface Measurement, 9:00-10:30 am. "The Use of Ultrasonics for the Detection of Discontinuities" and "A Measuring System for Displacements of Less Than One Microinch."

Surface Specifications in Manufacturing Operations—1, 10:45 am-12:00 noon. "Equipment Design and Machining Applications for Better Surface Finish" and "Precision Grinding the Required Surface Finish."

Surface Specifications in Manufacturing Operations—2, 1:30-3:00 pm. "The Application of Burnishing in Parts Finishing" and "A Preview of Surface Requirements and Specifications for the Future."

Open Forum Discussion Period, 3:15-4:30 pm.

#### Techtour — Manufacturing With Numerical Control Systems

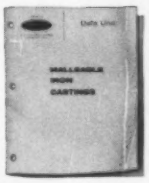
Session "A"—Engineering Papers, 8:30-10:30 am. "Auto-Prompt, A Three Dimen-

# Malleable Puts More Muscle in Machinery

In the agricultural equipment field, reputations depend on building products that can take rough treatment . . . and give real value. To do it, agricultural equipment manufacturers rely heavily on Malleable iron castings.

Malleable's excellent ductility and shock resistance mean longer life and fewer problems than obtainable with fabrications. Low start-up cost for small quantities also is vitally important in this competitive industry.

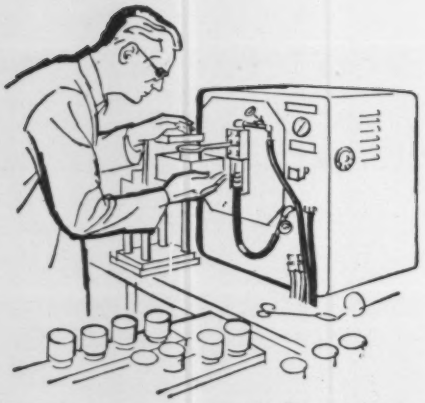
Put more reputation-building quality into your products at less cost with Malleable. For design assistance or quotations, call any company that displays this symbol —



**PROBLEM-SOLVING IDEAS** are yours free in Data Unit No. 115. For your copy, ask any member of the Malleable Castings Council, or write to Malleable Castings Council, Union Commerce Building, Cleveland 14, Ohio.

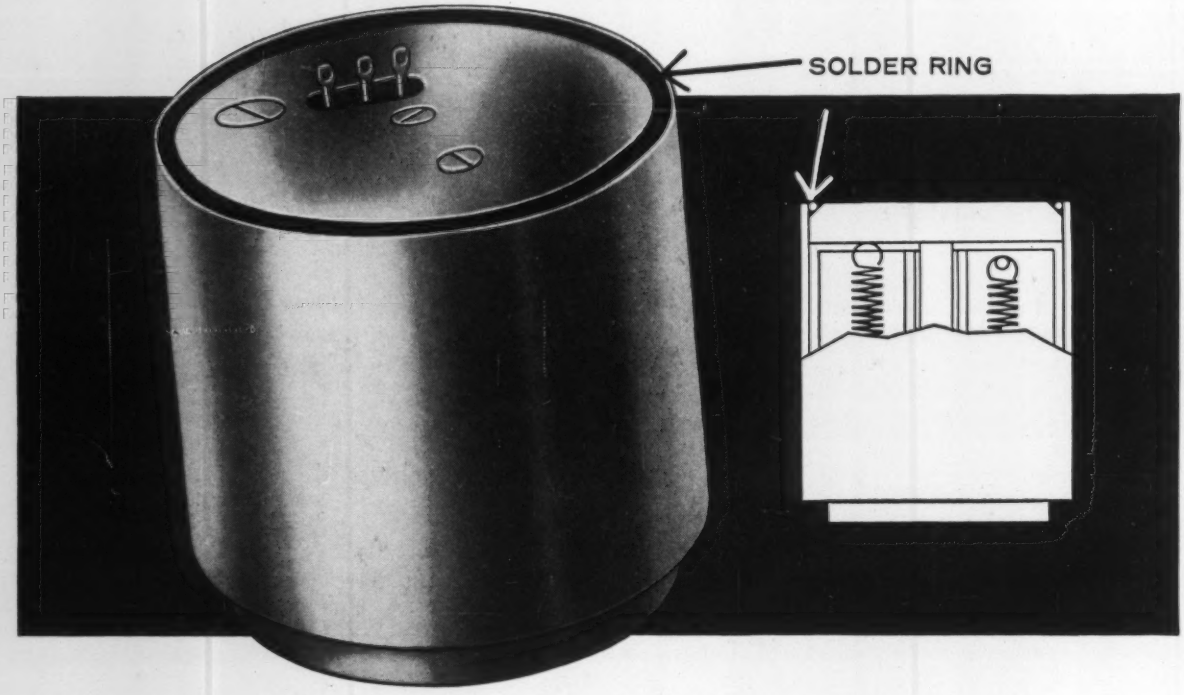
MEMBER
MALLEABLE
CASTINGS COUNCIL

The versatility of Malleable castings is reflected in the variety of ferritic and pearlitic Malleable tractor parts, from the tough, dependable front axle bar to bolsters, lift arms, clamps, clevises, hitches, hinges, foot pedals, transmission planetary carriers and clutch parts.



# Precision soldering 7 Times Faster...

## *with TOCCO* Induction Heating*




When G. M. Giannini and Co., Inc., Pasadena, California, switched from old-fashioned methods to TOCCO Induction Heating they increased production of these high-precision accelerometers from 4 to 30 per hour—with a commensurate *decrease* in production costs.

Here's what a Giannini official has to say about the TOCCO installation: "Prior to using TOCCO for this purpose, we had tried soldering irons, normal torches, resistance sealing, and even threaded screw fittings, with uniformly poor results. Essentially, the TOCCO unit has permitted us to build, in production quantities, oil-filled hermetically sealed units that could not be produced in any other way."

Whether your production bottleneck involves soldering, brazing, heat treating or heating for forming it pays you to investigate TOCCO as an economical way to do it better, faster and at lower cost.

**THE OHIO CRANKSHAFT COMPANY**

*Mail Coupon Today*— NEW FREE Bulletin

The Ohio Crankshaft Co. • Dept. A-4, Cleveland 5, Ohio

Please send copy of "Typical Results of TOCCO Induction Brazing and Soldering".

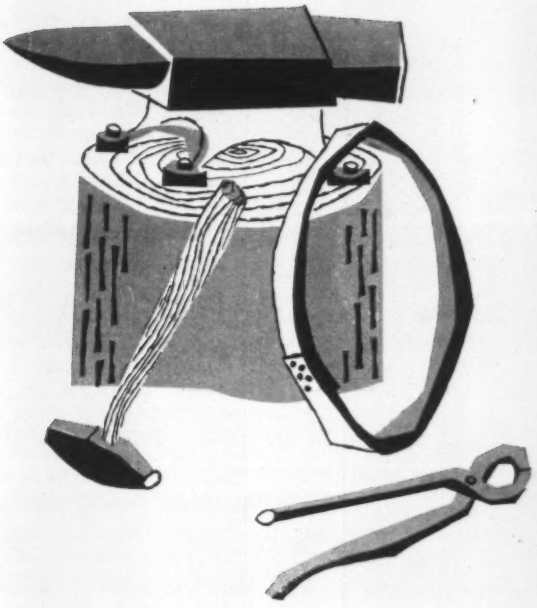
Name_____

Position_____

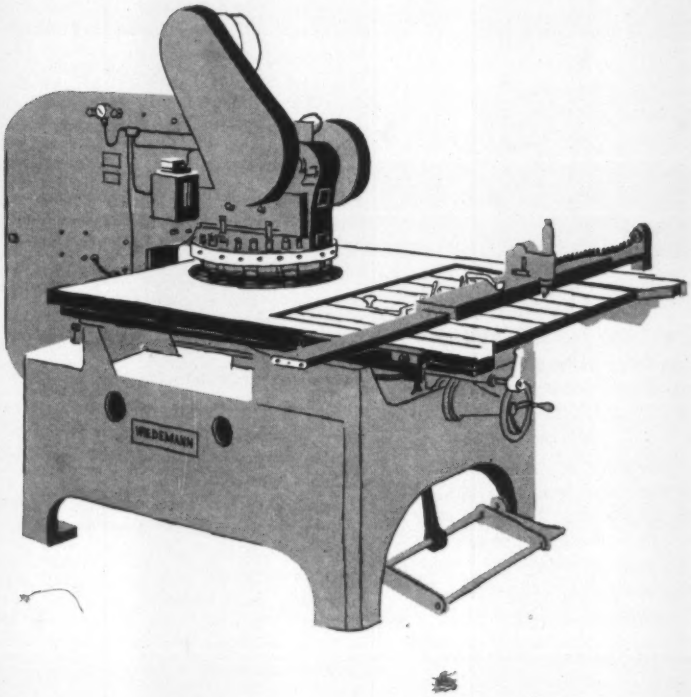
Company_____

Address_____

City_____ Zone____ State_____



# REMEMBER?




The blacksmith is one of the oldest metal fabricators. He served a long apprenticeship to learn how to accurately produce metal parts of almost any shape manually, employing little or no power equipment. Remember?

Metal fabricators frequently think along these lines and depend on skill and dexterity to produce accurate parts.

The "Wiedemann Method" employs mechanical work positioning equipment so simply that inexperienced men may become skilled operators in a very short period of time, often in a few days. Efficient, self trained Wiedemann operators and turret punch presses have replaced this slow costly hand work of metal fabricators.

Let Wiedemann Machine Company solve your hole positioning and punching problems. Learn how, merely by installing the "Wiedemann Method" you can realize 60% to 90% savings in your piercing operation. Drop us a line.

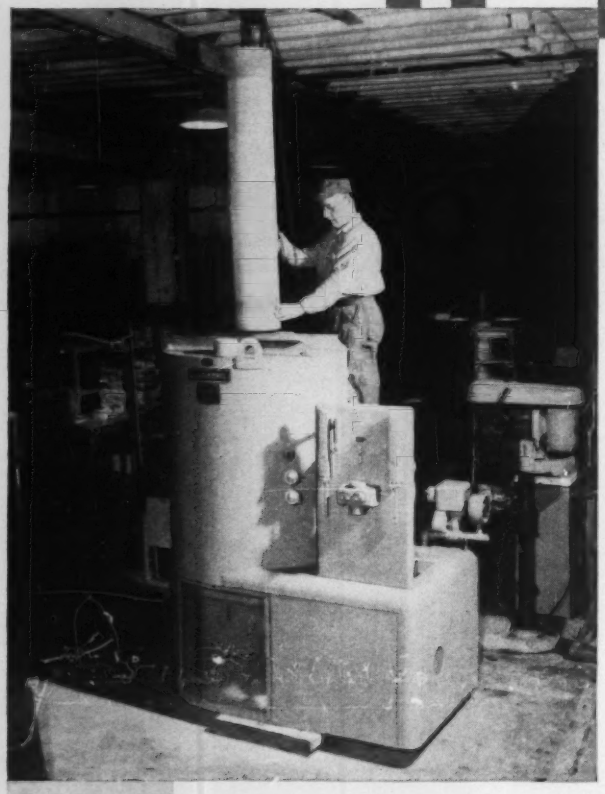
*From the versatile 150 ton R-15 down to the hand operated R-2, there's a Wiedemann for your short run piercing requirements.*

**WIEDEMANN**

**WIEDEMANN MACHINE COMPANY**
**Dept. IA4, Guiph Road • King of Prussia, Pa.**

DURALOY HOM

Covered by U.S. Patents



*Do your high alloy castings show a tendency to sag at 1800 to 2200°F? Is the operation important enough to use an alloy that stays firm at that temperature range?*

Then HOM is your casting requirement. It would take an unusually heavy load to deform this metal. It was developed by Duraloy metallurgists to be usable over that high temperature range—another milestone in the ever broadening services available to industry through Duraloy.

Why not discuss your extra high temperature problem with our metallurgical staff? Send for Bulletin G-159.

ALLOY CASTINGS INSTITUTE ACI MEMBER

THE DURALOY Company

OFFICE AND PLANT: Scottdale, Pa.

EASTERN OFFICE: 12 East 41st Street, New York 17, N. Y.

CHICAGO OFFICE: 332 South Michigan Avenue

DETROIT OFFICE: 23908 Woodward Avenue, Pleasant Ridge, Mich.

## SHOW PROGRAM

sional System for Numerical Control," "Planning a Maintenance Program for Numerical Control Equipment" and "Numerical Control Retrofit of Machine Tools."

Session "B" — Engineering Tour, 12:00 noon. Trip to Republic Aircraft Corp.

Session "C"—Panel Discussions, 4:40 pm.

### Wednesday, May 24

#### Technical Sessions

Powder Metallurgy, 9:30-11:00 am. "Self Lubrication Bearings: The Whys and Wherefores."

Numerically Controlled Machining, 2:15-4:15 pm. "Continuous Path Turning on Numerically Controlled Lathes" and "Numerically Controlled Turret Drilling."

#### Techtour — High-Energy Metalworking

Session "A" — Engineering Papers, 8:00 am.-12 noon. "Welding, Forging and Cutting with Explosives," "Explosive Forming at Grumman Aircraft" and "Forming, Forging and Compaction of Space-Age Metals by Controlled Explosion."

Session "B" — Engineering Tour, 12:45-3:15 pm.

#### Symposium — Material Removal Progress

Session "A"—Theory and Practice, 9:15-11:15 am. "Ultrahigh-Speed and Other Metalcutting Phenomena Explored by Dimensional Analysis," "Evaluation of Ceramic Tools" and "Method and Apparatus for Applying an Electric Potential to an Electrolytic Tool."

Session "B" — New Processes, 2:00-4:30 pm. "New Techniques of Metal-Removal Through Vibratory Finishing and Deburring" and "Electron Beam Process for Superalloys."

### Thursday, May 25

#### Technical Sessions

Workholding Developments, 9:15 - 11:15 am. "Clamping with Fiberglass-Reinforced Plastics" and "Electrostatic Force Employed To Hold Workpieces."

Appraising the Manufacturing System, 9:30-11:30 am. "Work Simplification at Texas Instruments—Philosophy, Training, Impact, Effectiveness."

Cutting Tool Materials, 2:00-4:00 pm. "Physical Properties and Applications of Various Steel-Bonded Carbides" and "Recent Developments in Metalcutting Carbides."

Material Removal, 2:30-4:30 pm. "New Horizons in Machining of Malleable Iron Components" and "Effects of Constituents and Casting Technique on Cast-Iron Machinability."

### Techtour — Manufacturing Operations Management

Session "A"—Engineering Papers, 9:00-11:00 am. "Special-Purpose Computers for Manufacturing and Manufacturing Planning," "Inventory Management" and "A Practical System for Work Load Calculation and Prediction for Small-Lot Production Shops."

Session "B" — Manufacturing Operations Demonstration, 12:30 pm. Trip to IBM.

Session "C"—Panel Discussion, 3:45 pm.

## Friday, May 26

### Technical Sessions

Tracer and Numerical Control Systems, 9:00-11:00 am. "Automatic Internal Override of Feed Rate in Numerically Controlled Contouring Machine Tool Systems" and "Upgrading Tracer Lathe Machine Operations."

Tool Engineering Progress, 9:30-11:30 am. "Instruments for Heat Treating" and "Fabrication Technique of High-Temperature Plastic Extrusion Molds."

## SHOW EXHIBITORS

| Exhibitor | Booth |
|---|---|
| AA Gage Co. | 2518 |
| Aaron Machinery Co. | 1615 |
| Accurate Bushing Co. | 2254 |
| ACF Electronics Div. | 1623 |
| Advance Products Corp. | 3302 |
| Aero Service Corp. | 3821 |
| Aget Mfg. Co. | 3922 |
| The Airetool Mfg. Co. | 1441 |
| Alameda Gage Co. | 3518 |
| Allegheny Ludlum Steel Corp. | 2233 |
| Aloris Tool Co., Inc. | 3839 |
| American Drill Bushing Co. | 2022 |
| American Mach. & Foundry; AMF Tool & Lowerator | 3515 |
| American Sip Corp. | 2246 |
| American Twist Drill | 1315 |
| American Pullmax Co. | 2012 |
| Ameurope Inc. | 3502 |
| Amitool Co., Inc. | 2646 |
| Andrews Tools & Machinery | 2617 |
| Antares Instrument Inc. | 3938 |
| Apex Mach. Co. | 2625 |
| Armstrong Bros. Tool | 3906 |
| Atlas Press.; Clausing Div. | 2434 |
| Austin Industrial Corp. | 1205 |
| Automatic Mill Inc. | 3233 |
| Avco Research & Advanced Development | 1024 |
| Avildsen Tools & Machines Inc. | 3136 |
| E. R. Bachmann Co., Inc. | 2202 |
| Balcrank Inc. | 3237 |
| Barer Engineering & Machining | 2127 |
| Beaver Pipe Tools | 3822 |
| Bellows Valvair Corp. | 2517 |
| Beloit Tool Corp. | 3702 |
| The Bendix Corp. | 1414 |
| Bentley Industrial Corp. | 2117 |
| Boeing Applied Computing Services | 2037 |
| H. P. Boggis Co. | 2642 |
| Boyar-Schultz Corp. | 2009 |
| Bridgeport Machines, Inc. | 1215 |
| Bristol Co. | 3318 |
| Brown & Sharpe Mfg. | 1315 |
| Buck Tool Co. | 1222 |
| Canton Chemical Co. | 3238 |
| Carr Lane Mfg. Co. | 1035 |
| Cavitron Equipment Corp. | 2533 |

Here is an attractive, level, flood-free site of 750 acres that will provide the space you need for present and future production needs. It is ideally located only 80 miles from Pittsburgh and Cleveland; 150 miles from Buffalo.

This Bessemer site scores high when you consider these advantages: 24-hour delivery of steel and other basic materials; extensive deposits of coal, limestone, clay and aggregates nearby; an ample labor force of widely diversified skills; abundant supplies of power, gas and water.

Investigate today! Complete, confidential site planning and industrial engineering services are available, without obligation.

**BESSEMER and LAKE ERIE RAILROAD CO.**

INDUSTRIAL DEVELOPMENT DEPARTMENT

1830 FRICK BUILDING • PITTSBURGH 30, PA. • ATLANTIC 1-4780

*The Bessemer Man is at your "Site Service"*

## SHOW EXHIBITORS

| Exhibitor | Booth |
|---|---|
| Cawi Mach. Co. | 3905 |
| Cazeneuve Lathe | 1328 |
| Cerro Sales Corp. | 1525 |
| Challenge Machinery | 2605 |
| Cincinnati Milling Mach. Co. | 1614 |
| Cincinnati Sub Zero Products | 2002 |
| Claremont Co., Inc. | 3946 |
| Clark, Cutler & McDermott | 1033 |
| Clearing Div., USI Inc. | 1440 |
| Clementina Ltd. | 2618 |
| Cleveland Instrument | 1423 |
| P. F. Collier, Inc. | 3911 |
| Coil Winding Equipment Co. | 2601 |
| Collins Microflat | 3226 |
| Columbia International Co. | 1308 |
| Commander Mfg. Co. | 3209 |
| Consolidated Kinetics Corp. | 1331 |
| Cooper Weymouth Inc. | 1239 |
| A. A. Crafts Co., Inc. | 3225 |
| C. C. Craley Mfg. Co. | 2010 |
| Crodian & Co. | 1345 |
| Crucible Steel Co. of America | 1603 |
| Crystal Lake Machinery | 3409 |
| Custanite Corp. | 3846 |
| Davey Compressor Co. | 1011 |
| Davidson Optronics | 3833 |
| Dayton Perforators | 1522 |
| Dechert Dynamics Co. | 3801 |
| Detroit Stamping Co. | 1419 |
| Devcon Corp. | 2134 |
| DeVlieg Microbore Div., DeVlieg Mach. Co. | 1314 |
| Di-Acro Corp., Oneil-Irwin Mfg. | 1404 |
| Diamond Tool Research Co. | 3310 |
| Die Draulic Grip Co. | 2621 |
| Diehl Mfg. Co. | 2135 |
| DoALL Co. | 2222 |
| Doeden Tool Corp. | 2016 |
| Dorsey Gage Co. | 3814 |
| Dow Mechanical Corp. | 3507 |
| Dumont Corp. | 3215 |
| Dumore Co. | 2428 |
| Dunham Tool Co. | 2610 |
| Durant Tool Co. | 3126 |
| Easco Products Inc. | 1624 |
| Eastern Mach. & Tool | 3907 |
| Edgecomb Engineering & Engraving Co. | 1030 |
| Enco Mfg. Co. | 3834 |
| Englehard Hanovia | 2650 |
| Erico Products Inc. | 3609 |
| Ettco Tool & Mach. Co. | 3202 |
| Farrand Controls Inc. | 2429 |
| Fenlind Engineering Co. | 1104 |
| Fenway Mach. Co. | 3206 |
| Ferguson Machine Corp. of Indiana | 2402 |
| Flick Reedy Corp. | 2221 |
| Frick-Gallagher Co. | 1131 |
| Friden Inc. | 3228 |
| Gaertner Scientific Corp. | 3222 |
| Gammons-Hoaglund Co. | 2628 |
| General Electric Co. | 3242 |
| General Indtl. Diamond | 3812 |
| Gisholt Mach. Co. | 2537 |
| Gleason Works | 3717 |
| Green Instrument Co. | 2636 |
| Grobet File Co. of America Inc. | 3116 |
| Gulf Oil Corp. | 2433 |
| W. & L. E. Gurley | 3240 |
| Hamilton Watch Co. | 3212 |
| Hammond Machinery Builders Inc. | 2217 |
| Clearing Mach. Co. | 1436 |
| Harig Mfg. Corp. | 1514 |
| Harnischfeger Corp. | 1429 |
| Heinrich Tools Inc. | 1227 |
| Heller Tool Co. | 2633 |
| Hermes Mach. Tool | 1114 |
| Hevi-Duty Electric Co. | 1423 |
| Hillyer Corp. | 3918 |
| Homestrand Mach. Tool | 3402 |
| Howard International Corp. | 1036 |
| Hudson Automatic Mach. & Tool Co. | 3401 |
| Hughes Industrial System | 2245 |
| Huron Machine Products | 3305 |
| Hy-Du-Lignum Co. | 3802 |
| Indi-Square Co. | 3837 |
| Industrial Mach. Services | 3508 |
| I.B.M., Data Processing Div. | 3718 |
| J & S Tool Co., Inc. | 3835 |
| Jarvis Corp., Carbide Subsidiary | 3219 |
| Jarvis Corp., Mach. Tool & Attachment Sub. | 1322 |
| Jiffy Disintegrator | 2502 |
| Jiffy Mfg. Co. | 3811 |
| Kennametal | 2445 |
| A. Klingelhofer Mach. Tool Corp. | 2501 |
| V. J. Krieg Inc. | 3501 |
| L & R Mfg. | 3241 |
| Lapointe Mach. Co. | 1105 |
| Lassy Tool Co. | 1728 |
| Laurel Corp. | 2615 |
| Livernois Engrg. Co. | 1533 |
| Logan Engineering | 1104 |
| Logansport Mach. Co., Inc. | 1325 |
| Lufkin Rule Co. | 2301 |
| M & M Tool & Mfg. Co. | 2632 |
| Mahr Gage Co. | 2209 |
| Malcus Tool Corp. | 3234 |
| Manex Machinery Corp. | 1706 |
| Marac Machinery Corp. | 2546 |
| Martin Engrg. Co. | 2103 |
| Master Chemical | 1226 |
| Master Mfg. Co. | 2422 |
| Machinery Builders Inc. | 2510 |
| Mercuria Co. | 2101 |
| Merrill Brothers | 3406 |
| Metal Products Div., General Electric Co. | 2118 |
| Metal Removal Co. | 1137 |
| Mettler Instruments | 3514 |
| Micrometrical Mfg. | 3617 |
| Micro Balancing, Inc. | 2627 |

**Suddenly complex finishing has a simple solution!**

The Pangborn Vibratory Finishing Machine has an unusually wide range of application. What would you like to descale, deburr, radius, finish or burnish?

Metal and metal alloy as well as many plastic and ceramic parts may be vibratory finished. This machine processes extremely small and delicate items with the same facility it handles large and heavy objects.

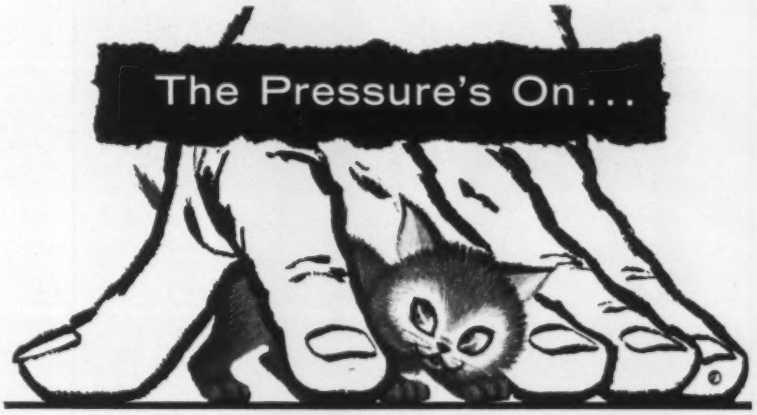
What's more, the Pangborn Vibratory Finishing Machine performs as much as 100 times faster than conventional equipment. Cuts costs? You bet!

All sizes of the machine come equipped with variable speeds and amplitudes plus new improved air-cushioned suspension. Optional air-cushioned floor mounts completely eliminate any transmission of vibration to the floor. Auxiliary equipment and the best in media and compounds are available for your every need. Send parts with exact finish specifications or finished specimen for sample processing in our laboratory to Mr. William E. Brandt at:

PANGBORN CORPORATION, 1500 Pangborn Blvd., Hagerstown, Md.; Pangborn Canada Ltd. 47 Shaft Rd., Toronto (Rexdale), Canada — *Manufacturers of Vibratory Finishing, Blast Cleaning, Dust Control Equipment — Rotoblast® Steel Shot and Grit®.*

**Pangborn**
OF HAGERSTOWN

| | |
|---|---|
| Miller Fluid Power Div. | 2221 |
| Minnesota Mining & Mfg. Co. | 3701 |
| Mitsui & Co., Ltd. | 3710 |
| Mitutoyo Mfg. Co. | 3138 |
| Mobil Oil Co. | 3418 |
| Modern Mfg. Co., Inc. | 3844 |
| Mohawk Tools Inc. | 1204 |
| Montgomery & Co. | 1223 |
| Moog Sercocontrols, Inc. | 1430 |
| Muskegon Tool Industries | 1122 |
| Nelco Tool Co. | 1315 |
| New Hermes Engraving Mach. Corp. | 3311 |
| Niemi Mfg. Co., Inc. | 1541 |
| Nikon Inc. | 2150 |
| Nissho American Corp. | 3312 |
| Noble & Westbrook | 3130 |
| North American Viking Drill | 1710 |
| Northwestern Tools | 3852 |
| Oakite Products Inc. | 3602 |
| Oberg Mfg. Co. | 2146 |
| O'Neil Irwin Mfg. | 1404 |
| Opto Metric Tools | 2201 |
| Kurt Orban Co. Inc. | 2011 |
| Osborn Mfg. Co. | 2407 |
| A. Ottavino Co. | 2611 |
| Parker-Kalon Co. | 3411 |
| Pedrick Mach. Co. | 1729 |
| Perkins Mach. Co. | 1229 |
| Permattach Diamond Tool Corp. | 2107 |
| PIC Design Corp. | 3505 |
| Pines Engineering Co. | 2019 |
| Portage Double Quick Co. Inc. | 2622 |
| Porter Precision Products | 3605 |
| Pratt & Whitney Co. | 2529 |
| Precision Carbide Corp. | 3913 |
| Precision Detroit | 3246 |
| Precision Welder & Flexopress Corp. | 2454 |
| Procunier Safety Chuck Co. | 1409 |
| Producto Mach. Co. | 2450 |
| Progressive Welder & Machinery Co. | 3825 |
| Punch Products Corp. | 1532 |
| Quality Control Corp. | |
| R. O. Mfg. Co. | 1025 |
| R. B. Tool Co. | 2640 |
| Ray Data Corp. | 1335 |
| R. E. Morris Co., Rem Sales Div. | 1128 |
| Ren Plastics Inc. | 3606 |
| Rheem Mfg. Co., Electronics Div. | 3510 |
| J. A. Richards Co. | 1631 |
| Wm. L. Riggs Co. | 1345 |
| Rowe Machinery & Mfg. Co., Inc. | 2307 |
| Rudel Machinery Co. | 2421 |
| S & S Machinery Co. | 2446 |
| Sandvik Steel Inc. | 1041 |
| Sanford Mfg. Corp. | 3829 |
| Scherr-Tumico Co. | 2138 |
| A. Scrader's Son Div., Scovill Mfg. Co. Inc. | 1521 |
| Scully Jones & Co. | 2521 |
| Edward Segal Machinery | 3229 |
| Seibert & Sons | 1001 |
| The Sentry Co. | 1724 |
| Service Mach. Co. | 3232 |
| The Sheffield Corp. | 1414 |
| Sheldon Mach. Co., Inc. | 1250 |
| Siewek Tool Co. | 2308 |
| Sifco Metachemical | 3912 |
| Sigma Machinery Inc. | 2230 |
| Simonds Abrasive Co., Simonds Saw & Steel | 3818 |
| Simplicity Engineering Co. | 3110 |
| Simpson Optical Mfg. | 1104 |
| Sintercast Div., Chromalloy Corp. | 3901 |
| Skilcraft Corp. | 3239 |
| South Bend Lathe | 1138 |
| Spitfire Tool & Mach. | 1529 |
| Standard Pressed Steel Co. | 2302 |
| STD Tool & Mfg. Co. | 1341 |
| Stanley Electrical Tools Div., Stanley Works | 3830 |
| Starlite Industries | 1725 |
| L. S. Starrett Co. | 1214 |
| Steco Corp. | 3417 |
| Stewart-Warner Corp. | 3917 |
| Sunnen Products Co. | 1515 |
| Sun Oil Co. | 3306 |
| Superior Die Set Co. | 3618 |
| Supreme Products Corp. | 1125 |
| Swanson Erie Corp. | 2534 |
| Taper Micrometer Co. | 3230 |
| Templet Industries Inc. | 3517 |
| Texaco Inc. | 3146 |
| Thompson Ramo Wooldridge, Gage Div. | 1536 |
| Torit Mfg. Co. | 3810 |
| Torrington Co. | 2105 |
| Traub Inc. | 3317 |
| Triplex Mach. Tool | 1604 |
| Field Office Serv., U. S. Dept. of Commerce | 2034 |
| U. S. Tool Co. | 2250 |
| Uddeholm Co. of America | 2121 |
| Ultramatic Equipment Co. | 3509 |
| Ultrasonic Precision Co. | 2234 |
| Upton Bradeen & James Ltd. | 3601 |
| VDF Lathe Div., Rudel Mach. | 2246 |
| Van Keuren Co. | 3218 |
| Vernon Devices Inc. | 3120 |
| Vidmar Inc. | 2545 |
| Visual Inspection Products Co. | 3236 |
| Vlier Engineering Co. | 2122 |
| Vulcan Tool Co. | 1550 |
| Wadell Equipment Co., Inc. | 1040 |
| Wales Strippit Inc. | 1305 |
| O. S. Walker Co. | 2418 |
| Watts Regulator Co. | 2006 |
| Vlier Engineering Co. | 2122 |
| Waukesha Cutting Tools Inc. | 3914 |
| Wheelabrator Corp. | 1502 |
| Wesco Tool, Inc. | 1141 |
| S. B. Whistler & Sons | 2550 |
| Thomas C. Wilson Co. | 1218 |
| Wilton Tool Mfg. | 3838 |
| Winslow Products Engineering | 1240 |
| Wintriss Inc. | 1235 |
| The Zero-Max Co. | 2025 |


with Sof-Loc* HYDRAULIC HOLDDOWN SYSTEM

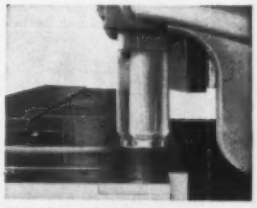
...GENTLE but POSITIVE

...exclusive on Lodge & Shipley POWER SQUARING SHEARS

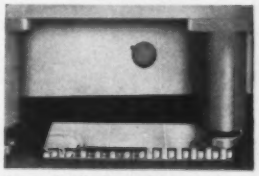
Tons of pressure, but applied so gently and quickly... using air for speed, oil for pressure... that's the secret of the exclusive Lodge & Shipley Sof-Loc Holddown. Quietly, without damage to easily marred surfaces, it gives unequalled holding power for fast, "dead accurate" shearing of light sheets or heavy plates.

Sof-Loc is but one of a combination of features you need but won't find on any other shear. These features and the advantages they give are described in a new 20-page catalog of Lodge & Shipley Shears: capacities from 10 gauge to 3/8" for heavy duty and high production shearing.

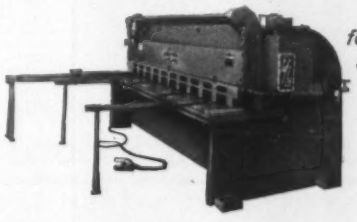
Request Bulletin S-347 from: The Lodge & Shipley Co., 3073 Colerain Ave., Cincinnati 25, Ohio.



Holddown fingers are individually adjustable and removable.



Impact eliminated, so is damage to easily-marred material.

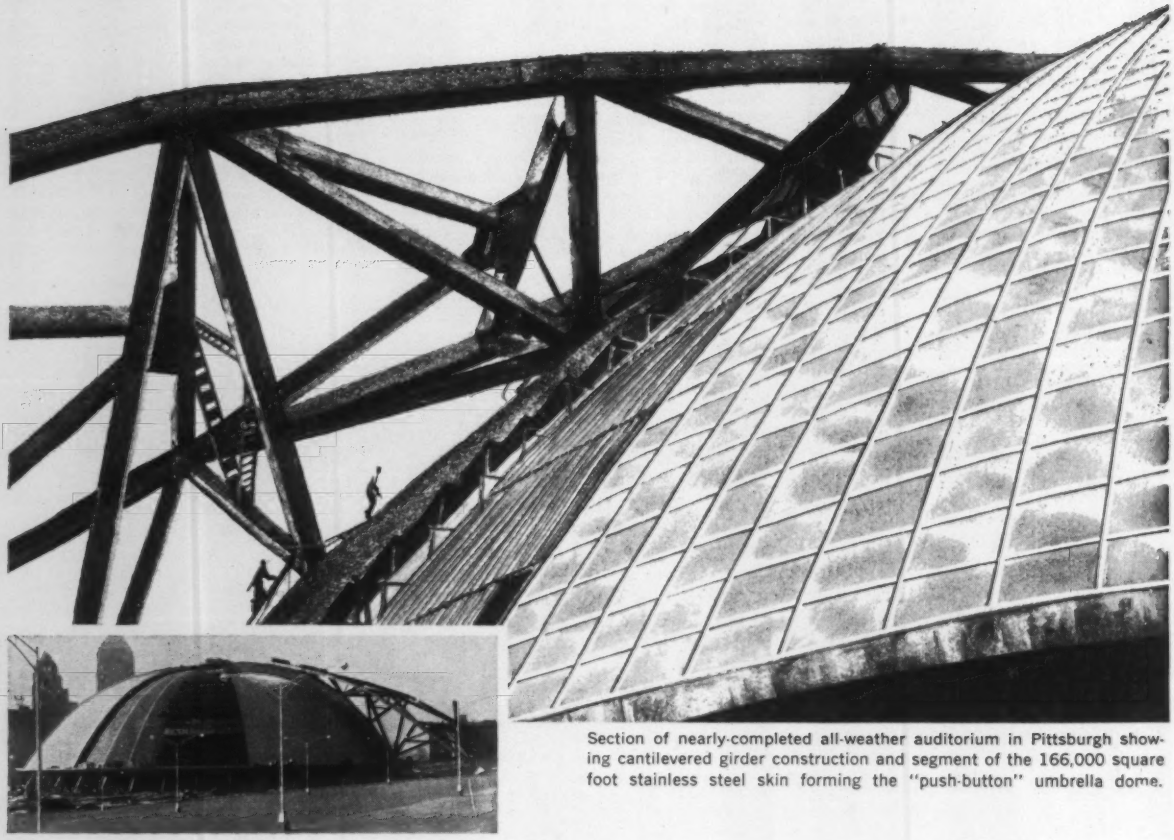


for shear excellence, choose...

Lodge & Shipley

*PATENTED, TRADEMARK REGISTERED

# when you're producing Electric Steels



Section of nearly-completed all-weather auditorium in Pittsburgh showing cantilevered girder construction and segment of the 166,000 square foot stainless steel skin forming the "push-button" umbrella dome.

## GLC Electrodes will give you these extra values

When you specify GLC electrodes you get a product of **superior quality, plus** such extra values as...
**unceasing research** that leads to steady product improvement...
**substantial inventories** maintained for your convenience...
**fast shipment** and delivery...
and **technical service** for customers that is remarkably prompt and competent.
These extra values are important as they provide a substantial share in the reduction of melt-ton costs.

PRODUCTS YOU CAN TRUST — ELECTRODE — GLC — DIVISION

**GREAT LAKES CARBON CORPORATION**

18 EAST 48TH STREET, NEW YORK 17, N.Y. OFFICES IN PRINCIPAL CITIES

# A 10 Pct Pickup Likely in May

**If present indicators prove out, May will be 10 pct better than April. And a surge of late April business brought a pickup over March.**

**Steelmen again are looking for 95 million tons as a goal that can be reached this year.**

■ Another 10 pct increase in May should put the steel industry's operating rate up to 65 pct of capacity.

The expected increase for May will follow back-to-back a similar pickup for this month. An increase in number and volume of late orders this month pushed April up almost 10 pct over March.

**In Balance**—As it stands right now, the steel industry is close to equilibrium: That is, the rate of incoming orders, steelmaking operations, and the rate of consumption are all in balance, around 60 pct. Any uptrend of orders, such as that expected in May, will result in an immediate gain in steelmaking.

It is now likely that the improvement will continue at least through the second quarter. Steelmen who had predicted production of 95 million tons of steel this year are showing renewed confidence that this figure will be reached. This confidence was not apparent a month ago.

**Depends on Summer**—But any goal of 95 million tons will be reached only if there is little or no summer letdown. The possibility of a severe summer slump can not be discounted now, but there are indications that summer business may not fall off enough to hurt the recovery seriously. Plant shutdowns and other seasonal factors will result in some summer dip, but it may not be as severe as predicted a short time ago.

The current pickup in steel operations continues to be based on a broad line of products from a wide area of consumers. However, galvanized and tinplate are way out in front. And some pickup in automotive orders recently has added to the flat-rolled strength.

**Galvanized Hot**—One major mill says galvanized is sold out through June; another says its books on galvanized are full through June 15. No other products can show anything remotely resembling this strength. Nevertheless, in a few areas, lead times are lengthening out.

In spite of the generally better outlook, there are three factors that may still affect the recovery: The summer letdown, strength of the general economic recovery, and auto labor negotiations.

**Some Questions**—To what extent these factors will affect the market is still open to question.

The current improvement is due largely to two forces: Seasonal improvement and an end of inventory liquidation. There is still no major force that will lift the recovery to better than a moderate rate of improvement.

The automotive steel market is still up in the air. The gain in sales has not been as great as expected, but stocks of unsold new cars have been trimmed.

There has been a pickup in automotive steel buying to back up recent increases in production. But unless car sales pickup, there is not likely to be a great change in steel buying from Detroit.

## District Steel Production Index 1957-59=100

| | Last Week | Two Weeks Ago | Month Ago | Year Ago |
|---|---|---|---|---|
| North East Coast | 101 | 103 | 92 | 117 |
| Buffalo | 92 | 88 | 77 | 124 |
| Pittsburgh | 87 | 86 | 80 | 117 |
| Youngstown | 78 | 70 | 65 | 109 |
| Cleveland | 95 | 91 | 89 | 146 |
| Detroit | 107 | 106 | 100 | 121 |
| Chicago | 97 | 96 | 92 | 127 |
| Cincinnati | 98 | 87 | 84 | 132 |
| St. Louis | 105 | 112 | 103 | 107 |
| Southern | 104 | 102 | 100 | 117 |
| Western | 116 | 113 | 106 | 109 |
| **U. S. Index** | 95.8 | 93.8 | 87.6 | 120.1 |

Source: American Iron & Steel Institute

## Steel Production, Composite Prices

| **Production** | Last Week | Two Weeks Ago | To Date 1961 | To Date 1960 |
|---|---|---|---|---|
| (Net tons, 000 Omitted) | 1,784 | 1,748 | 25,186 | 41,530 |
| **Ingot Index** | | | | |
| (1957-59=100) | 95.8 | 93.8 | 84.5 | 139.3 |
| **Composite Prices** | This Week | Week Ago | Month Ago | Year Ago |
| Finished Steel base (Cents per lb) | 6.196 | 6.196 | 6.196 | 6.196 |
| Pig Iron (Gross ton) | $66.44 | $66.44 | $66.44 | $66.41 |
| Scrap No. 1 hvy (Gross ton) | $37.50 | $37.83 | $39.17 | $33.50 |
| No. 2 bundles | $25.17 | $25.83 | $27.83 | $23.17 |

# Reevaluate the Foreign Prices

**Production costs are rising for many overseas manufacturers. Prices may be climbing, too.**

**One purchasing agent suggests you examine new U. S. prices. They might, he says, be just as cheap.**

**S. H. MESHA, JR.:** "Let's check the American prices . . ."

■ If you're buying components or raw materials abroad, it may be time to reevaluate the advantages of these purchases. At least this is the advice of S. H. Mesha, Jr., purchasing director, Arnold Schwinn and Co.

Mr. Mesha is highly regarded among purchasing men as a student of foreign market trends. Evaluating the present outlook, he notes that overseas costs are beginning to rise.

The purchasing specialist says there are times when buyers must go to foreign markets. For example, he lists these: (1) When parts can be bought abroad at reduced prices; (2) parts with prestige value; (3) parts that can be bought in sufficient quantity to attract a U. S. manufacturer.

**Price Scare** — Mr. Mesha points out there are some product lines of foreign manufacturers where no price rise is reflected. This, he says, is because overseas producers are becoming nervous as profit margins shrink. As long as American competitors keep prices down, they will too.

Another factor to remember: American producers have been fighting to lower certain prices. In many cases, says Mr. Mesha, U. S. manufacturers have lowered cost through revised engineering. Now, the product may be almost as cheap in this country as it is overseas. The Schwinn purchaser notes that labor costs are rising rapidly in many foreign areas.

**Deliveries Current**—In his opinion, growing labor shortages such as are common in France and West Germany, aren't yet causing any extensions in delivery times. The item to watch, he says, is the deteriorating profit margins aboard. They could lead to long-term price jumps.

There are certain points that must be remembered by the purchaser when establishing overseas costs. Mr. Mesha says buyers must figure on higher inventory costs. Then too, there is the cost of handling defective parts and service for replacement parts.

When a purchasing agent buys from abroad, he must commit himself to a longer lead time, higher materials inventory, and a greater risk of defective parts during shipments.

**Another Consideration**—The reevaluation of the German mark may also have a bearing in the market price picture. In effect, whether actual price is changed or not, cost has increased five pct in terms of U. S. dollars.

Mr. Mesha comments: "We've done some offshore buying in recent years in an effort to meet competition when they also bought foreign-made materials. But we're finding, as some of the electronics industry buyers also report, that we can buy more and more of these parts here without forcing up our own costs.

"Even with the reevaluation of the mark, some German suppliers have been hinting at price increases for the past several months. One of their reasons, for example, is the higher ratio of benefits they are having to pay their labor forces as the labor shortage increases."

*Shell Tellus Oils are refined and formulated to meet exacting hydraulic service requirements, such as in this forming machine.*

PHOTO COURTESY ATLANTIC PLASTICS INC., STAMFORD, CONNECTICUT

# BULLETIN:

## Shell provides a quick 6-point check list for hydraulic oils: Use it to pick the right oil for your needs

**Selecting the proper hydraulic fluid for your equipment can be one of your most important decisions. And it can pay off in many ways. Less down time. Lower cost per unit. Longer equipment lite.**

**Here are six bench marks to help you pick the best hydraulic oil tor your plant requirements.**

**1. Does it have good oxidation stability?** Oxidized hydraulic oil can form gums, lacquers and other deposits which may foul moving parts. Shell Tellus Oils are carefully refined to remove unstable, sludge-forming components, then fortified with a Shell-developed oxidation inhibitor.

**2. Will it resist foaming and emulsification?** Pump chatter and erratic operation are often the result of pump cavitation, brought on by oil foaming. Tellus® Oils contain powerful additives to help prevent foaming.

They also contain a selected inhibitor to combat effects of moisture that might be in the system.

**3. Does it fight rust and corrosion?** It is difficult to exclude all moisture from a hydraulic system. And moisture can form troublesome rust. Shell Tellus Oils have been carefully compounded to resist corrosion.

**4. What are its lubrication qualities in continuous service?** Shell Tellus Oils form a clinging, oily film on mating metal surfaces. This maintains a constant guard against wear.

**5. How does it react to temperature changes?** This is a key factor in the performance of hydraulic equipment. Careful selection of the proper viscosity grade of Tellus assures satisfactory operation of your system over its entire temperature range.

**6. Is it available in several viscosity grades?** Shell Tellus Oils are available in a broad range of viscosity grades. There's a special grade for virtually every hydraulic requirement.

Ask your Shell Industrial Products Representative for facts on Tellus Oils. Or write: Shell Oil Co., 50 West 50th St., New York 20, N. Y.

**A message to manufacturers of hydraulic equipment**

There is a Shell Tellus Oil suited for your equipment.

**1.** Your customers can get Tellus Oils at Shell depots everywhere. Readily available throughout the world.

**2.** Quality is consistently high. Tellus always delivers top performance.

SHELL

**A BULLETIN FROM SHELL**
**—where 1,997 scientists are working to provide better products for industry**

# Delivery Promises Fail to Lengthen

**Despite the scare talk from mills recently, delivery promises have changed little.**

**Mills are still going after orders on a rush basis. Only galvanized is really tight.**

■ With few exceptions, delivery promises have failed to lengthen despite the improvement in business. It appears that mills are trying to convince customers that delivery stretchouts are imminent; that they should build up inventories to avoid getting caught short.

At the same time, mills continue to offer short delivery—and, privately, some say they should be able to do so until operating rate gets up to about 75 pct of capacity.

The East Coast and Detroit districts are the only areas where delivery promises have lengthened—and then only selectively.

**Mill Reluctance**—Low stocks in the hands of users seem to have caused the lengthening on the East Coast. Bars, plates and structurals moved up a week on the minimum end to about two weeks instead of one week. It seems to be more a matter of mill reluctance to add more workers or another shift than it is a rush of orders. Maximum deliveries, for example, remain unchanged at three and four weeks.

**Auto Buying**—The recent flurry of automotive orders from Detroit has caused a more general advance of delivery promises in that area. Cold-rolled sheet and strip have advanced to four-to-six weeks. They had been quoted at two-to-four weeks.

Hot-rolled sheet and strip are now quoted at three-to-five weeks, up from two-to-four weeks. The maximum on bars changed a little, but many items are still available within a week of ordering.

## Delivery Promises at a Glance

| | East | Pittsburgh | Cleveland | Detroit | Chicago | West Coast |
|---|---|---|---|---|---|---|
| CR Carbon Sheet | 2–5 wks | 2–4 wks | 2–4 wks | 4–6 wks | 2–4 wks | 5 wks |
| HR Carbon Sheet | 2–4 wks | 2–4 wks | 1–3 wks | 3–5 wks | 2–4 wks | 4 wks |
| CR Carbon Strip | 2–5 wks | 3–5 wks | 2–4 wks | 4–6 wks | 3–4 wks | 4 wks |
| HR Carbon Strip | 2–4 wks | 2–4 wks | 1–3 wks | 3–5 wks | 2–4 wks | 4–5 wks |
| HR Carbon Bars | 2–4 wks | 1–3 wks | 1–4 wks | 1–6 wks | 1–3 wks | 4 wks |
| CF Carbon Bars | 2–4 wks | 1–3 wks | Stock–4 wks | 1–5 wks | 2–5 wks | 1–2 wks |
| Heavy Plate | 2–3 wks | 1–2 wks | | | 1–2 wks | 5 wks |
| Light Plate | 2–3 wks | 1–2 wks | 1–3 wks | | 1–2 wks | 4 wks |
| Merchant Wire | Stock | Stock | Stock | | 2–3 wks | 2 wks |
| Oil Country Goods | Stock | Stock | Stock | | Stock–1 wk | |
| Linepipe | Stock | 1–4 wks | Stock | | 2–3 wks | Stock |
| Buttweld Pipe | Stock | Stock | Stock | Stock | 2–3 wks | Stock |
| Structurals | 2–4 wks | 1–2 wks | 1–4 wks | 1–4 wks | 2–3 wks | Stock–4 wks |
| CR Stainless Sheet | Stock–4 wks | Stock–3 wks | Stock–3 wks | Stock–5 wks | | |
| CR Stainless Strip | Stock–4 wks | Stock–3 wks | Stock–3 wks | Stock–5 wks | | |

**Sheet and Strip** — Spot orders from the auto industry continue to bolster the sheet and strip market in most districts. An exception is **Pittsburgh;** orders are still far below a year ago.

Orders have picked up from a variety of **East Coast** users and some auto tonnage has been moved up to the end of April from May. Smaller users continue to come in and support the automotive buyers in **Cleveland.** And May is beginning to shape up as an improvement over April.

**Detroit** reports a similar improvement due to the automotive production spurt. A rumor that cold-rolled sheet delivery promises in the **Chicago** area were about to go out about two weeks caused a flurry of orders there. Even some large users are down to a week or less on inventories.

**Galvanized**—This is undoubtedly the strongest product. Mills in **Pittsburgh** are booked to mid-June, at least one is booked up to July. Delivery promises are out to about five weeks in **Cleveland.** And they are as much as six weeks in **Chicago.** A similar situation exists along the **East Coast.**

Armco Steel Corp., **Middletown, O.,** is now marketing a new, paintable zinc-coated steel which it calls "Zincgrip A, Paintgrip." New facilities permit producing zinc-coated sheets and coils up to 72-in. wide at a rate of 30 tons per hour.

**Bars**—Gains in bar products continue to be very moderate. **Pittsburgh** mills say Detroit is the weakest market. However, reports from the automotive center indicate that there has been at least a local improvement—small though it is. Alloy bars are showing some life in **Chicago,** but not enough to extend delivery promises.

**Plates and Shapes**—Buying is a little better on the **East Coast,** but the upturn is small. Slow improvement is shown in **Pittsburgh,** but there has not been the decisive lift producers have hoped for. Plate is the easiest item in **Chicago,** but structurals are a little stronger.

# COMPARISON OF PRICES

*(Effective April 24, 1961)*

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price changes from previous week are shown by an asterisk (*).

| | Apr. 24 1961 | Apr. 17 1961 | Mar. 27 1961 | Apr. 26 1960 |
|---|---|---|---|---|
| **Flat-Rolled Steel:** (per pound) | | | | |
| Hot-rolled sheets | 5.10¢ | 5.10¢ | 5.10¢ | 5.10¢ |
| Cold-rolled sheets | 6.275 | 6.275 | 6.275 | 6.275 |
| Galvanized sheets (10 ga.) | 6.875 | 6.875 | 6.875 | 6.875 |
| Hot-rolled strip | 5.10 | 5.10 | 5.10 | 5.10 |
| Cold-rolled strip | 7.425 | 7.425 | 7.425 | 7.425 |
| Plate | 5.30 | 5.30 | 5.30 | 5.30 |
| Plates, wrought iron | 14.10 | 14.10 | 14.10 | 14.10 |
| Stainl's C-R strip (No. 302) | 52.00 | 52.00 | 52.00 | 52.00 |
| **Tin and Terneplate:** (per base box) | | | | |
| Tin plates (1.50 lb.) cokes | $10.65 | $10.65 | $10.65 | $10.65 |
| Tin plates, electro (0.50 lb.) | 9.35 | 9.35 | 9.35 | 9.35 |
| Special coated mfg. ternes | 9.90 | 9.90 | 9.90 | 9.90 |
| **Bars and Shapes:** (per pound) | | | | |
| Merchants bar | 5.675¢ | 5.675¢ | 5.675¢ | 5.675¢ |
| Cold finished bar | 7.65 | 7.65 | 7.65 | 7.65 |
| Alloy bar | 6.725 | 6.725 | 6.725 | 6.725 |
| Structural shapes | 5.50 | 5.50 | 5.50 | 5.50 |
| Stainless bars (No. 302) | 46.75 | 46.75 | 46.75 | 46.75 |
| Wrought iron bars | 14.90 | 14.90 | 14.90 | 14.90 |
| **Wire:** (per pound) | | | | |
| Bright wire | 8.00¢ | 8.00¢ | 8.00¢ | 8.00¢ |
| **Rails:** (per 10 lb.) | | | | |
| Heavy rails | $5.75 | $5.75 | $5.75 | $5.75 |
| Light rails | 6.725 | 6.725 | 6.725 | 6.725 |
| **Semifinished Steel:** (per net ton) | | | | |
| Rerolling billets | $80.00 | $80.00 | $80.00 | $80.00 |
| Slabs, rerolling | 80.00 | 80.00 | 80.00 | 80.00 |
| Forging billets | 99.50 | 99.50 | 99.50 | 99.50 |
| Alloys, blooms, billets, slabs | 119.00 | 119.00 | 119.00 | 119.00 |
| **Wire Rods and Skelp:** (per pound) | | | | |
| Wire rods | 6.40¢ | 6.40¢ | 6.40¢ | 6.40¢ |
| Skelp | 5.05 | 5.05 | 5.05 | 5.05 |
| **Finished Steel Composite:** (per pound) | | | | |
| Base price | 6.196¢ | 6.196¢ | 6.196¢ | 6.196¢ |

| | Apr. 24 1961 | Apr. 17 1961 | Mar. 27 1961 | Apr. 26 1960 |
|---|---|---|---|---|
| **Pig Iron:** (per gross ton) | | | | |
| Foundry, del'd Phila. | $70.68 | $70.68 | $70.68 | $70.57 |
| Foundry, South Cin'ti | 71.92 | 71.92 | 71.92 | 73.87 |
| Foundry, Birmingham | 62.50 | 62.50 | 62.50 | 62.50 |
| Foundry, Chicago | 66.50 | 66.50 | 66.50 | 66.50 |
| Basic, del'd Philadelphia | 70.11 | 70.11 | 70.11 | 70.07 |
| Basic, Valley furnace | 66.00 | 66.00 | 66.00 | 66.00 |
| Malleable, Chicago | 66.50 | 66.50 | 66.50 | 66.50 |
| Malleable, Valley | 66.50 | 66.50 | 66.50 | 66.50 |
| Ferromanganese, 74-76 pct Mn, cents per lb.‡ | 11.00 | 11.00 | 11.00 | 11.00 |
| **Pig Iron Composite:** (per gross ton) | | | | |
| Pig iron | $66.44 | $66.44 | $66.44 | $66.41 |
| **Scrap:** (per gross ton) | | | | |
| No. 1 steel, Pittsburgh | $35.50 | $35.50 | $35.50 | $34.50 |
| No. 1 steel, Phila. area | 39.50* | 40.50 | 42.50 | 34.50 |
| No. 1 steel, Chicago | 37.50 | 37.50 | 39.50 | 31.50 |
| No. 1 bundles, Detroit | 33.50* | 34.50 | 33.50 | 30.50 |
| Low phos., Youngstown | 38.50 | 38.50 | 40.50 | 36.50 |
| No. 1 mach'y cast, Pittsburgh | 45.50 | 45.50 | 45.50 | 50.50 |
| No. 1 mach'y cast, Phila. | 50.50 | 50.50 | 50.50 | 51.50 |
| No. 1 mach'y cast, Chicago | 49.50 | 49.50 | 51.50 | 52.50 |
| **Steel Scrap Composite:** (per gross ton) | | | | |
| No. 1 hvy. melting scrap | $37.50* | $37.83 | $39.17 | $33.50 |
| No. 2 bundles | 25.17* | 25.83 | 27.83 | 23.17 |
| **Coke, Connellsville:** (per net ton at oven) | | | | |
| Furnace coke, prompt | $14.75-15.50 | 14.75-15.50 | 14.75-15.50 | 14.75-15.50 |
| Foundry coke, prompt | 18.50 | 18.50 | 18.50 | 18.50 |
| **Nonferrous Metals:** (cents per pound to large buyers) | | | | |
| Copper, electrolytic, Conn. | 29.00 | 29.00 | 29.00 | 33.00 |
| Copper, Lake, Conn. | 29.00 | 29.00 | 29.00 | 33.00 |
| Tin, Straits, N. Y. | 100.50† | 100.50 | 100.50 | 99.25 |
| Zinc, East St. Louis | 11.50 | 11.50 | 11.50 | 13.00 |
| Lead, St. Louis | 11.00 | 11.00 | 11.00 | 11.80 |
| Aluminum, ingot | 26.00 | 26.00 | 26.00 | 28.10 |
| Nickel, electrolytic | 74.00 | 74.00 | 74.00 | 74.00 |
| Magnesium, ingot | 36.00 | 36.00 | 36.00 | 36.00 |
| Antimony, Laredo, Tex. | 29.50 | 29.50 | 29.50 | 29.50 |

† Tentative. ‡ Average. ** Revised.

**Finished Steel Composite**

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

**Pig Iron Composite**

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo and Birmingham.

**Steel Scrap Composite**

Average of No. 1 heavy melting steel scrap and No. 2 bundles delivered to consumers at Pittsburgh, Philadelphia and Chicago.

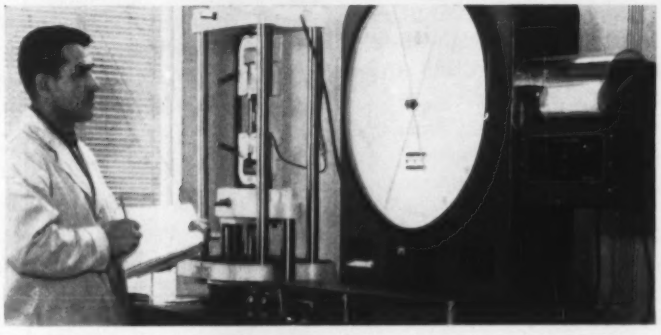
## INDEX TO PRICE PAGES


Prices At a Glance ..... 159
Comparison of Prices ..... 163
Bars ..... 172
Billets, Blooms and Slabs ..... 170
*Boiler Tubes
*Clad Steel
Coke ..... 175
*Electrical Sheets
*Electrodes
*Electroplating Supplies
Fasteners ..... 174
Ferroalloys ..... 176
Iron Ore ..... 174
Merchant Wire Products ..... 174
*Metal Powders
Nonferrous
- Mill Products ..... 169
- Primary Prices ..... 163, 168, 169
- Remelted Metals ..... 169
- Scrap ..... 169

Piling ..... 170
Pig Iron ..... 174
Pipe and Tubing ..... 175
Plates ..... 172
*Rails
*Refractories
Service Center Prices ..... 173
Shapes ..... 170
Sheets ..... 171
*Spring Steel
Stainless ..... 174
Steel Scrap ..... 166
Strip ..... 170
Structurals ..... 170
Tinplate ..... 171
Tool Steel ..... 174
*Track Supplies
Water Pipe Index ..... 175
Wire ..... 172
Wire Rod ..... 171


*Appears in the April 20-May 4 issues.


Quality Control "Lab" **Insures Quality** Products!



To continue with Ulbrich's policy of constantly giving customers more and better service Ulbrich has installed a fully equipped laboratory. After conversion of steel stocks to customer requirements, physical properties are checked on such equipment as a Tinius Olsen Tensile Machine, pictured above. Bend Test equipment, Rockwell Testers, a Kentron Micro-Hardness Tester and a complete chemical department supply time saving, accurate analysis and Quality Stainless Steel to *exact* customer specifications.

FOR FAST SERVICE AND DELIVERY
CONTACT YOUR LOCAL STAINLESS STEEL SERVICE CENTER
FOR WEST COAST SERVICE

BRENNER COMPANY
35 No. Raymond Ave., Pasadena, Calif.
MUrray 1-9349 MUrray 1-8322

SPECIAL METALS SUPPLY CO.
175 Demiter St., Palo Alto, Calif.
DA 6-8181

SINCE 1924
Ulbrich
"the biggest little mill in the country"

WRITE, WIRE OR PHONE
ULBRICH STAINLESS STEELS
WALLINGFORD, CONNECTICUT
TWX 277 Phone COlony 9-1434

# Domestic Demand Still Missing

**Prices are off again this week as the market falters without domestic support.**

**Even areas which have shown recent strength are now reflecting a softer trend.**

■ Prices are still dropping in key scrap markets. Definite weakness has entered a market that, just one month ago, was at its strongest level in more than one year.

Reason: Export commitments were made early in the second quarter. And domestic interest failed to show beyond the occasional small tonnage point.

The Pittsburgh market, for example, is quiet this week. Mills are doing little or no buying. Off-list sales in Detroit, Chicago, and other key areas brought prices $2 to $4 down from last month. In Philadelphia, a leading broker says the market is in a period of adjustment. What he calls "more sensible prices" are being established.

Even areas which showed some signs of strength last week now reflect a softer trend. Price drops are looked for on the West Coast. And an expected downturn materialized in St. Louis this week.

The IRON AGE composite price for No. 1 heavy melting is off for the third consecutive week. It's down to $37.50. The composite price for No. 2 bundles also fell again to $25.17.

**Pittsburgh**—The market is quiet. Mills are doing little or no buying. Scrapmen are talking lower prices but are holding back offers until the industrial lists and the next mill purchase give a better indication of the new level. Both auto and railroad tonnages are heavy this month. Prices were down $2 to $4 on a few early offerings. Brokers predict a general decline. However, the actual demand won't be known until the big lists close. In the only activity for the dealer market, a price of $26 for No. 2 bundles is still being offered by one mill. Stainless scrap appears to be withstanding the weakness of other grades. Cast is reported easier.

**Chicago** — An off-list factory bundle sale at $3 under the market threw some confusion into the Midwest picture. But it did not step up the scrap flow at present prices. Dealer stocks continue very low. Expected export buying next month has pinned prices at present levels and is keeping scrap flow to domestic mills at a low level. Foundry grades appear to be firming.

**Philadelphia**—Prices continue to drop in this market. One broker says the market is in a period of adjustment. He says it is "settling back to sensible prices." Export activity remains brisk. But most shipments are based on earlier commitments. Domestic interest is still lacking.

**New York**—There's a streak of pessimism starting to show up in this market. For now, business is fair and current prices are holding. Most dealers are busy filling old orders. But some dealers confide that steelmaking grades may drop soon.

**Detroit**—Recent off-list sales by auto companies indicate the market is taking a softer turn. Sales by Fisher Body Co. and a smaller tonnage by Chrysler Corp. last week brought $2 to $3 less per ton than one month ago. Whether the overall market will take a similar turn will be known late this week when industrial lists close. Tonnages will be greater than in April.

**Cleveland** — Rebids on excess tonnage from auto plants were down $2 from the beginning of the month. Big lists this week will probably be off at least that much. Two-ft cut structural is moving at $38 and $39 although a small special tonnage was bought for $36.

**Cincinnati**—Market is off $1 as brokers cover old orders. Some additional decline is expected in new monthly prices. Rebids on industrial scrap were off sharply.

**St. Louis**—The expected downturn in scrap prices materialized this week with losses of $1 and $2 registered. Demand continues slow with only small tonnages bought by local mills. The export market is no longer a factor here. However, feeling is that it will make itself known again within six weeks.

**Birmingham**—Brokers cut nominal quotations on heavy melting scrap in line with reductions made by exporters. The move offsets the $2 per ton increase in ship charter rates. Other prices remain unchanged. But there is little buying.

**Buffalo** — Prices are unchanged in a quiet market. There were no new sales this week.

**Boston** — Activity is slackening slightly in export. Also, domestic interest is becoming weak.

**West Coast**—There's an undertone of weakness creeping into this market. Because of exporting, demand for No. 1 heavy melting continues strong. There's little hope of any increased mill buying to change the outlook soon.

**Houston** — Signs of weakness continue to pervade the market. Brokers are anticipating lower prices. Some are talking of as much as a $2 drop.

Popular package is 8-oz. can fitted with Bakelite cap holding soft-hair brush for applying right at bench; metal surface ready for layout in a few minutes. The dark blue background makes the scribed lines show up in sharp relief, prevents metal glare. Increases efficiency and accuracy.

*Write for sample on company letterhead*

THE DYKEM COMPANY
2303G North 11th St. • St. Louis 6, Mo.

# CUT SCRAPER TIME

**END NIGHT CLEANUP & MORNING REBLUING**

DYKEM HI-SPOT BLUE No. 107 is used to locate high spots when scraping bearing surfaces. As it does not dry, it remains in condition on work indefinitely, saving scraper's time. Intensely blue, smooth paste spreads thin, transfers clearly. No grit; noninjurious to metal. Uniform. Available in collapsible tubes of three sizes. Order from your supplier. Write for free sample tube on company letterhead.

THE DYKEM CO., 2303-G NORTH 11TH ST., ST. LOUIS 6, MO.

# THE LITTLE AND THE BIG IN PERFORATED MATERIALS

Standard Mundt perforations range from 950 holes per square inch to 0.046 holes per square inch in round hole patterns. You'll find equal variety in square, oblong, diagonal, diamond, herringbone and other decorative and functional patterns.

Mundt perforates all basic metals and alloys as well as bonded, coated, clad and textured metals, plastics, plywood, fibre and wood. Where a product has not been previously perforated, we will make an experimental run without charge to determine perforating qualities.

You'll find Mundt is small enough to take an interest in your minor perforation problems . . . large enough to provide quick delivery from its vast stocks. Write for the new Mundt catalog for your design and purchasing files.

**CHARLES MUNDT & SONS**
**OUR 92ND YEAR**
53 FAIRMOUNT AVENUE, JERSEY CITY 4, N. J.

# GOSS and DE LEEUW

MULTIPLE SPINDLE
**CHUCKING MACHINES**
*Tool Rotating*
GOSS & DE LEEUW MACHINE CO., KENSINGTON, CONN.

# Let SUN SHIP solve your machine problem

When you need machine work or specially built machinery of any kind, you'll find Sun Ship qualified to do the job exactly to your specifications. We have machine tools of every size, and the facilities and skills born of long experience.

When you have a machining problem, write or phone

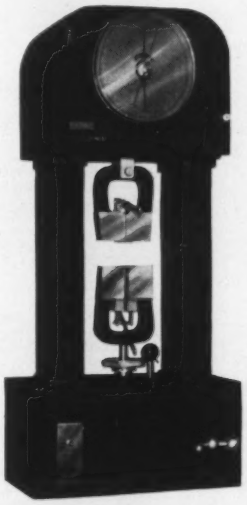
SALES ENGINEERING DEPARTMENT

**Sun** SHIPBUILDING & DRY DOCK COMPANY
CHESTER, PA.

# ACCURACY + ECONOMY

*with an*

# OLSEN L-C



There's no need to sacrifice testing accuracy, speed or convenience for low cost—you get all these and much more with a Tinius Olsen L-C. Dual capacities—1000 lbs or 10,000 lbs—are indicated on the same large dial. Accuracy is guaranteed to meet ASTM and government specs for tension, compression and transverse testing. Choice of hand operated or motor driven models. Request Bulletin 41 for full details. Tinius Olsen Testing Machine Company.

**TINIUS OLSEN**
2120 Easton Rd.
Willow Grove, Pa.

# SCRAP PRICES *(Effective April 24, 1961)*

## Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

### Pittsburgh

| | |
|---|---|
| No. 1 hvy. melting | $35.00 to $36.00 |
| No. 2 hvy. melting | 30.00 to 31.00 |
| No. 1 dealer bundles | 36.00 to 37.00 |
| No. 1 factory bundles | 43.00 to 44.00 |
| No. 2 bundles | 27.00 to 28.00 |
| No. 1 busheling | 35.00 to 36.00 |
| Machine shop turn. | 15.00 to 16.00 |
| Shoveling turnings | 20.00 to 21.00 |
| Cast iron borings | 19.00 to 20.00 |
| Low phos. punch'gs plate | 42.00 to 43.00 |
| Heavy turnings | 31.00 to 32.00 |
| No. 1 RR hvy. melting | 39.00 to 40.00 |
| Scrap rails, random lgth. | 46.00 to 47.00 |
| Rails, 2 ft and under | 51.00 to 52.00 |
| RR specialties | 44.00 to 45.00 |
| No. 1 machinery cast. | 45.00 to 46.00 |
| Cupola cast. | 38.00 to 39.00 |
| Heavy breakable cast. | 35.00 to 36.00 |
| Stainless | |
| 18-8 bundles and solids | 180.00 to 185.00 |
| 18-8 turnings | 100.00 to 110.00 |
| 430 bundles and solids | 80.00 to 85.00 |
| 410 turnings | 55.00 to 60.00 |

### Chicago

| | |
|---|---|
| No. 1 hvy. melting | $37.00 to $38.00 |
| No. 2 hvy. melting | 31.00 to 32.00 |
| No. 1 dealer bundles | 37.00 to 38.00 |
| No. 1 factory bundles | 42.00 to 43.00 |
| No. 2 bundles | 23.00 to 24.00 |
| No. 1 busheling | 37.00 to 38.00 |
| Machine shop turn. | 15.00 to 16.00 |
| Mixed bor. and turn. | 17.00 to 18.00 |
| Shoveling turnings | 17.00 to 18.00 |
| Cast iron borings | 17.00 to 18.00 |
| Low phos. forge crops | 45.00 to 46.00 |
| Low phos. punch'gs plate, ¼ in. and heavier | 43.00 to 44.00 |
| Low phos. 2 ft and under | 41.00 to 42.00 |
| No. 1 RR hvy. melting | 40.00 to 41.00 |
| Scrap rails, random lgth. | 48.00 to 49.00 |
| Rerolling rails | 58.00 to 60.00 |
| Rails 2 ft and under | 51.00 to 52.00 |
| Angles and splice bars | 46.00 to 47.00 |
| RR steel car axles | 59.00 to 60.00 |
| RR couplers and knuckles | 46.00 to 47.00 |
| No. 1 machinery cast. | 49.00 to 50.00 |
| Cupola cast. | 44.00 to 45.00 |
| Cast iron wheels | 36.00 to 37.00 |
| Malleable | 48.00 to 49.00 |
| Stove plate | 39.00 to 40.00 |
| Steel car wheels | 44.00 to 45.00 |
| Stainless | |
| 18-8 bundles and solids | 175.00 to 180.00 |
| 18-8 turnings | 100.00 to 105.00 |
| 430 bundles and solids | 90.00 to 95.00 |
| 430 turnings | 50.00 to 55.00 |

### Philadelphia Area

| | |
|---|---|
| No. 1 hvy. melting | $39.00 to $40.00 |
| No. 2 hvy. melting | 34.00 to 35.00 |
| No. 1 dealer bundles | 41.00 to 42.00 |
| No. 2 bundles | 24.00 to 25.00 |
| No. 1 busheling | 40.00 to 41.00 |
| Machine shop turn. | 14.00 to 15.00 |
| Mixed bor. short turn. | 16.00 to 17.00 |
| Cast iron borings | 14.00 to 15.00 |
| Shoveling turnings | 19.00 to 20.00 |
| Clean cast. chem. borings | 27.00 to 28.00 |
| Low phos. 5 ft and under | 43.00 to 44.00 |
| Low phos. 2 ft punch'gs | 45.00 to 46.00 |
| Elec. furnace bundles | 43.00 to 44.00 |
| Heavy turnings | 27.00 to 28.00 |
| RR specialties | 45.00 to 46.00 |
| Rails, 18 in. and under | 52.00 to 54.00 |
| Cupola cast. | 41.00 to 42.00 |
| Heavy breakable cast. | 39.00 to 40.00 |
| Cast iron car wheels | 42.00 to 43.00 |
| Malleable | 48.00 to 49.00 |
| No. 1 machinery cast. | 50.00 to 51.00 |

### Cincinnati

**Brokers buying prices per gross ton on cars:**

| | |
|---|---|
| No. 1 hvy. melting | $31.00 to $32.00 |
| No. 2 hvy. melting | 27.50 to 28.50 |
| No. 1 dealer bundles | 31.00 to 32.00 |
| No. 2 bundles | 20.00 to 21.00 |
| Machine shop turn. | 10.00 to 11.00 |
| Shoveling turnings | 12.00 to 13.00 |
| Cast iron borings | 12.00 to 13.00 |
| Low phos. 18 in. and under | 37.00 to 38.00 |
| Rails, random length | 41.00 to 42.00 |
| Rails, 18 in. and under | 46.00 to 47.00 |
| No. 1 cupola cast. | 34.00 to 35.00 |
| Heavy breakable cast. | 28.00 to 29.00 |
| Drop broken cast. | 45.00 to 46.00 |

### Youngstown

| | |
|---|---|
| No. 1 hvy. melting | $37.00 to $38.00 |
| No. 2 hvy. melting | 25.00 to 26.00 |
| No. 1 dealer bundles | 37.00 to 38.00 |
| No. 2 bundles | 24.00 to 25.00 |
| Machine shop turn. | 15.00 to 16.00 |
| Shoveling turnings | 18.00 to 19.00 |
| Low phos. plate | 38.00 to 39.00 |

### Cleveland

| | |
|---|---|
| No. 1 hvy. melting | $33.50 to $34.50 |
| No. 2 hvy. melting | 24.00 to 25.00 |
| No. 1 dealer bundles | 33.50 to 34.50 |
| No. 1 factory bundles | 39.00 to 40.00 |
| No. 2 bundles | 22.50 to 23.50 |
| No. 1 busheling | 33.50 to 34.50 |
| Machine shop turn. | 13.00 to 14.00 |
| Mixed bor. and turn. | 16.00 to 17.00 |
| Shoveling turnings | 16.00 to 17.00 |
| Cast iron borings | 16.00 to 17.00 |
| Cut structural & plates, 2 ft & under | 38.00 to 39.00 |
| Low phos. punch'gs plate | 34.50 to 35.50 |
| Drop forge flashings | 33.50 to 34.50 |
| Foundry steel, 2 ft & under | 33.00 to 34.00 |
| No. 1 RR hvy. melting | 37.50 to 38.50 |
| Rails 2 ft and under | 48.00 to 49.00 |
| Rails 18 in. and under | 49.00 to 50.00 |
| Steel axle turnings | 26.00 to 27.00 |
| Railroad cast. | 47.00 to 48.00 |
| No. 1 machinery cast. | 47.00 to 48.00 |
| Stove plate | 38.00 to 39.00 |
| Malleable | 50.00 to 51.00 |
| Stainless | |
| 18-8 bundles | 170.00 to 175.00 |
| 18-8 turnings | 95.00 to 100.00 |
| 430 bundles | 85.00 to 90.00 |

### Buffalo

| | |
|---|---|
| No. 1 hvy. melting | $31.00 to $32.00 |
| No. 2 hvy. melting | 26.00 to 27.00 |
| No. 1 busheling | 31.00 to 32.00 |
| No. 1 dealer bundles | 31.00 to 32.00 |
| No. 2 bundles | 24.00 to 25.00 |
| Machine shop turn. | 13.00 to 14.00 |
| Mixed bor. and turn. | 14.00 to 15.00 |
| Shoveling turnings | 17.00 to 18.00 |
| Cast iron borings | 15.00 to 16.00 |
| Low phos. plate | 37.00 to 38.00 |
| Structurals and plate, 2 ft and under | 39.00 to 40.00 |
| Scrap rails, random lgth. | 38.00 to 39.00 |
| Rails 2 ft and under | 48.00 to 49.00 |
| No. 1 machinery cast. | 44.00 to 45.00 |
| No. 1 cupola cast. | 38.00 to 39.00 |

### St. Louis

| | |
|---|---|
| No. 1 hvy. melting | $34.00 to $35.00 |
| No. 2 hvy. melting | 28.00 to 29.00 |
| Foundry steel, 2 ft | 31.00 to 32.00 |
| No. 1 dealer bundles | 34.00 to 35.00 |
| No. 2 bundles | 23.00 to 24.00 |
| Machine shop turn. | 12.50 to 13.50 |
| Shoveling turnings | 14.50 to 15.50 |
| Cast iron borings | 21.00 to 22.00 |
| No. 1 RR hvy. melting | 36.00 to 37.00 |
| Rails, random lengths | 39.00 to 40.00 |
| Rails, 18 in. and under | 43.00 to 44.00 |
| RR specialties | 39.00 to 40.00 |
| Cupola cast. | 38.00 to 39.00 |
| Heavy breakable cast. | 32.00 to 33.00 |
| Stove plate | 32.00 to 33.00 |
| Cast iron car wheels | 34.00 to 35.00 |
| Rerolling rails | 54.00 to 55.00 |
| Unstripped motor blocks | 34.00 to 35.00 |

### Birmingham

| | |
|---|---|
| No. 1 hvy. melting | $32.00 to $33.00 |
| No. 2 hvy. melting | 28.00 to 29.00 |
| No. 1 dealer bundles | 32.00 to 33.00 |
| No. 2 bundles | 19.00 to 20.00 |
| No. 1 busheling | 37.50 to 38.50 |
| Machine shop turn. | 18.00 to 19.00 |
| Shoveling turnings | 20.00 to 21.00 |
| Cast iron borings | 10.00 to 11.00 |
| Electric furnace bundles | 36.50 to 37.50 |
| Elec. furnace, 3 ft & under | 36.00 to 37.00 |
| Bar crops and plate | 43.00 to 44.00 |
| Structural and plate, 2 ft | 42.00 to 43.00 |
| No. 1 RR hvy. melting | 35.00 to 36.00 |
| Scrap rail, random lgth. | 41.00 to 42.00 |
| Rails, 18 in. and under | 46.00 to 47.00 |
| Angles and splice bars | 43.00 to 44.00 |
| No. 1 cupola cast. | 43.00 to 44.00 |
| Stove plate | 43.00 to 44.00 |
| Cast iron car wheels | 35.00 to 36.00 |
| Unstripped motor blocks | 33.00 to 34.00 |

### New York

**Brokers buying prices per gross ton on cars:**

| | |
|---|---|
| No. 1 hvy. melting | $31.00 to $32.00 |
| No. 2 hvy. melting | 25.00 to 26.00 |
| No. 2 dealer bundles | 19.00 to 20.00 |
| Machine shop turnings | 5.00 to 6.00 |
| Mixed bor. and turn. | 5.00 to 6.00 |
| Shoveling turnings | 7.00 to 8.00 |
| Clean cast. chem. borings | 20.00 to 21.00 |
| No. 1 machinery cast. | 38.00 to 39.00 |
| Mixed yard cast. | 34.00 to 35.00 |
| Heavy breakable cast. | 32.00 to 33.00 |
| Stainless | |
| 18-8 prepared solids | 160.00 to 165.00 |
| 18-8 turnings | 80.00 to 85.00 |
| 430 prepared solids | 70.00 to 75.00 |
| 430 turnings | 20.00 to 25.00 |

### Detroit

**Brokers buying prices per gross ton on cars:**

| | |
|---|---|
| No. 1 hvy. melting | $30.00 to $31.00 |
| No. 2 hvy. melting | 26.00 to 27.00 |
| No. 1 dealer bundles | 33.00 to 34.00 |
| No. 2 bundles | 20.00 to 21.00 |
| No. 1 busheling | 29.00 to 30.00 |
| Drop forge flashings | 28.00 to 29.00 |
| Machine shop turn. | 9.00 to 10.00 |
| Mixed bor. and turn. | 12.00 to 13.00 |
| Shoveling turnings | 12.00 to 13.00 |
| Cast iron borings | 12.00 to 13.00 |
| Heavy breakable cast. | 29.00 to 30.00 |
| Mixed cupola cast. | 34.00 to 35.00 |
| Automotive cast. | 40.00 to 41.00 |
| Stainless | |
| 18-8 bundles and solids | 170.00 to 175.00 |
| 18-8 turnings | 70.00 to 75.00 |
| 430 bundles and solids | 70.00 to 75.00 |

### Boston

**Brokers buying prices per gross ton on cars:**

| | |
|---|---|
| No. 1 hvy. melting | $29.50 to $30.50 |
| No. 2 hvy. melting | 24.00 to 25.00 |
| No. 1 dealer bundles | 29.00 to 30.00 |
| No. 2 bundles | 16.00 to 17.00 |
| No. 1 busheling | 29.00 to 30.00 |
| Machine shop turn. | 4.00 to 4.50 |
| Shoveling turnings | 9.50 to 10.00 |
| Clean cast. chem. borings | 15.50 to 16.50 |
| No. 1 machinery cast. | 40.00 to 41.00 |
| Mixed cupola cast. | 32.00 to 32.50 |
| Heavy breakable cast. | 28.00 to 29.00 |

### San Francisco

| | |
|---|---|
| No. 1 hvy. melting | $42.00 |
| No. 2 hvy. melting | 38.00 |
| No. 1 dealer bundles | 30.00 |
| No. 2 bundles | 25.00 |
| Machine shop turn. | 15.00 |
| Cast iron borings | 15.00 |
| No. 1 cupola cast. | $45.00 to 46.00 |

### Los Angeles

| | |
|---|---|
| No. 1 hvy. melting | $42.00 |
| No. 2 hvy. melting | 38.00 |
| No. 1 dealer bundles | 31.00 |
| No. 2 bundles | 27.00 |
| Machine shop turn. | 15.00 |
| Shoveling turnings | 15.00 |
| Cast iron borings | 15.00 |
| Elec. furnace 1 ft and under (foundry) | $48.00 to 50.00 |
| No. 1 cupola cast. | 45.00 to 46.00 |

### Seattle

| | |
|---|---|
| No. 1 hvy. melting | $42.00 |
| No. 2 hvy. melting | 38.00 |
| No. 2 bundles | 25.00 |
| No. 1 cupola cast. | 36.00 |
| Mixed yard cast. | 31.00 |

### Hamilton, Ont.

**Brokers buying prices per net ton on cars:**

| | |
|---|---|
| No. 1 hvy. melting | $31.00 |
| No. 2 hvy. melting cut 3 ft and under | 28.00 |
| No. 1 dealer bundles | 31.00 |
| No. 2 bundles | 21.00 |
| Mixed steel scrap | 23.00 |
| Bush., new fact., prep'd | 31.00 |
| Bush., new fact., unprep'd | 25.00 |
| Machine shop turn. | 8.00 |
| Short steel turn. | 12.00 |
| Mixed bor. and turn. | 12.00 |
| Cast scrap | 32.00 |

### Houston

**Brokers buying prices per gross ton on cars:**

| | |
|---|---|
| No. 1 hvy. melting | $39.00 |
| No. 2 hvy. melting | 36.00 |
| No. 2 bundles | 28.00 |
| Machine shop turn. | 8.00 |
| Shoveling turnings | 11.00 |
| Cut structural plate 2 ft & under | $50.00 to 51.00 |
| Unstripped motor blocks | 32.00 to 33.00 |
| Cupola cast. | 37.00 to 38.00 |
| Heavy breakable cast. | 30.00 to 31.00 |

# LOOK TO LURIA

## FOR GUARANTEED ANALYSIS OF STAINLESS AND ALLOY STEEL SCRAP

COMPARE FACILITIES FOR INSPECTION • SEGREGATION • TESTING • SERVICE

*Luria Brothers and Company, Inc.*

**MAIN OFFICE** • CHRYSLER BUILDING EAST, NEW YORK 17, N. Y.
**BRANCH OFFICES** • BIRMINGHAM, ALA. • BOSTON, MASS. • BUFFALO, N. Y. • CHICAGO, ILL. • CINCINNATI, OHIO • CLEVELAND, OHIO • DETROIT, MICHIGAN • HOUSTON, TEXAS • KOKOMO, INDIANA • LOS ANGELES, CALIF. • NEW YORK, N. Y. • PITTSBURGH, PENNA. • PHILADELPHIA, PENNA. • PUEBLO, COLORADO • READING, PENNA. • ST. LOUIS, MISSOURI • SAN FRANCISCO, CALIF. • SEATTLE, WASH. • In Canada • MONTREAL, QUEBEC—HAMILTON, ONTARIO
**PLANTS** • MODENA, PENNA. • MONTREAL, QUEBEC, CANADA

**FOREIGN TRADE—LURIA INTERNATIONAL DIV.**, CHRYSLER BUILDING EAST, NEW YORK, N. Y. • 5950 S. BOYLE AVE., LOS ANGELES 58, CAL. • *Cable Address:* FORENTRACO.

# Aluminum Leaders Forecast Gains

**Big Three aluminum producers predict improved business for the rest of the year.**

**All three report sales upturns ending the first quarter.**

■ Business isn't good, but it's going to get better. This is the consensus from first quarter reports of the Big Three U. S. aluminum producers.

Aluminum Co. of America, Reynolds Metals Co., and Kaiser Aluminum & Chemical Corp. all report sales and earnings in the first quarter were substantially below the same period in 1960.

But all three companies say things have started to pick up. And they express confidence for total 1961 sales—to varying degrees.

**Alcoa Hopeful** — Perhaps the most hopeful is Alcoa. The company says it "views business prospects for the balance of 1961 with a new degree of optimism based on a recent moderate upturn in sales, improving sales forecasts, and a definite knowledge that customer inventories are lower than at this time last year."

Company Chairman Frank L. Magee said, "We feel confident that strong factors are already at work creating the next upsurge in demand."

**Kaiser Reserved** — Kaiser was somewhat more reserved. The company admitted that the "substantial" increase in shipments late in the first quarter was due in part to "normal seasonal factors." But, Kaiser says, "A general improvement in the metalworking industry is now evident."

Kaiser is putting another potline back in operation at its Ravenswood, W. Va., plant. But this still leaves operations at something under 60 pct of capacity.

**Reynolds Feeling** — Richard S. Reynolds, Jr., president of Reynolds Metals, says: (1) There is a marked feeling of optimism among customers. (2) There has been a great deal of sales activity in recent weeks.

But the Reynolds executive admits increases have been just about seasonal, and there has been no great pickup in orders.

**Not Convinced**—Despite the optimism voiced by the major producers, many in the industry are still not convinced that 1961 is going to be a good year.

Sales started picking up in March. But the upward trend is not gaining momentum.

Just about everyone concedes the worst is over for this aluminum recession. But some observers say the rate of improvement may well be so slow that the recession will not really be over until very late in the year—too late to balance a bad first half.

**Eye Inventories** — One of the market factors everyone is watching is inventories of aluminum customers. There is no doubt they are low.

But since U. S. capacity will continue to top demand for at least several years, many users say they will keep stocks at rock bottom and push producers for immediate delivery.

Others hope that as the economy firms and the industry talks up its need for a higher price, some buyers will be knocked off the fence. This could be the difference between a good and fair year.

## Zinc

In its annual report for 1960, the American Zinc Institute managed to find a gleam in an otherwise dull year.

"Shipments of continuously galvanized sheet to the automotive industry reached an all time high in 1960," says the report.

AZI Executive Secretary John L. Kimberly sees this as "marking an accelerated growth trend," and, "as a continuing development."

**Shipments Up**—Total shipments of galvanized sheet to automakers in 1960 hit 218,960 tons, up from 158,280 in 1959. There has been a steady move upward from the 87,-408 tons shipped to this market in 1955.

From nine-month statistics, AZI figures total U. S. consumption of zinc dropped to 861,125 tons last year from 956,197 tons in 1959. All markets were off.

## Tin Prices For the Week

April 18—107.25; April 19—107.625; April 20—108.375; April 21—108.375; April 24—108.25.*

* Estimate

## Primary Prices

| (cents per lb.) | current price | last price | date of change |
|---|---|---|---|
| Aluminum Ingot | 26.00 | 24.70 | 12/17/59 |
| Copper (E) | 29.00 | 30.00 | 1/16/61 |
| Copper (CS) | 29.00 | 30.00 | 1/11/61 |
| Copper (L) | 29.00 | 30.00 | 1/16/61 |
| Lead, St. L. | 10.80 | 11.80 | 12/13/60 |
| Lead, N. Y. | 11.00 | 12.00 | 12/13/60 |
| Magnesium Ingot | 36.00 | 34.50 | 8/13/56 |
| Magnesium pig | 35.25 | 33.75 | 8/13/56 |
| Nickel | 74.00 | 64.50 | 12/6/56 |
| Titanium sponge | 150-160 | 162-182 | 8/1/59 |
| Zinc, E. St. L. | 11.50 | 12.50 | 1/12/61 |
| Zinc, N. Y. | 12.00 | 13.00 | 1/12/61 |

**ALUMINUM: 99% Ingot. COPPER: (E) = electrolytic, (CS) = custom smelters, electrolytic. (L) = lake. LEAD: common grade. MAGNESIUM: 99.8% pig Velasco, Tex. NICKEL: Port Colborne, Canada. ZINC: prime western. Other primary prices, pg. 169.**

# NONFERROUS PRICES

## MILL PRODUCTS

*(Cents per lb unless otherwise noted)*

### ALUMINUM

*(Base 30,000 lb, f.o.b. customer's plant)*

**Flat Sheet (Mill Finish and Plate)**

*("F" temper except 6061-0)*

| Alloy | .030-.038 | .048-.061 | .077-.096 | .136-.250 |
|---|---|---|---|---|
| 1100, 3003 | 48.4 | 47.4 | 46.4 | 45.4 |
| 5052 | 55.8 | 53.0 | 50.8 | 49.2 |
| 6061-0 | 53.0 | 50.3 | 48.4 | 47.0 |

**Extruded Solid Shapes**

| Factor | 6063 T-5 | 6062 T-6 |
|---|---|---|
| 1-17 | 45.3-46.8 | 54.0-61.8 |
| 18-32 | 45.8-47.5 | 58.6-81.5 |
| 33-38 | 49.5-52.2 | 85.1-96.6 |
| 39-44 | 59.8-63.6 | 102.0-124.0 |

**Screw Machine Stock—2011-T-3**

| Size" | 7/32-5/16 | 11/32-23/32 | 3/4-1 1/16 | 1 3/32-1 1/2 |
|---|---|---|---|---|
| Price | 60.0 | 59.2 | 57.7 | 55.3 |

**Roofing Sheet, Corrugated**

(Per sheet, 26" wide base, 16,000 lb)

| Length"→ | 72 | 96 | 120 | 144 |
|---|---|---|---|---|
| .019 gage | $1.506 | $2.013 | $2.515 | $3.017 |

### MAGNESIUM

*(F.o.b. shipping pt., carload frt. allowed)*

**Sheet and Plate**

| Type↓ Gage→ | .250 3.00 | .250-2.00 | .188 | .081 | .032 |
|---|---|---|---|---|---|
| AZ31B Stand. Grade | ..... | 67.9 | 69.0 | 77.9 | 103.1 |
| AZ31B Spec. | ..... | 93.3 | 96.9 | 108.7 | 171.3 |
| Tread Plate | ..... | 70.6 | 71.7 | ..... | ..... |
| Tooling Plate | 73.0 | ..... | ..... | ..... | ..... |

**Extruded Shapes**

| factor→ | 6-8 | 12-14 | 24-26 | 36-38 |
|---|---|---|---|---|
| Comm. Grade. (AZ31C) | 65.3 | 65.3 | 66.1 | 71.5 |
| Spec. Grade... (AZ31B) | 84.6 | 85.7 | 90.6 | 104.2 |

**Alloy Ingot**

AZ91B (Die Casting)..... 37.25 (delivered)
AZ63A, AZ92A, AZ91C (Sand Casting) 40.75 (Velasco, Tex.)

### NICKEL, MONEL, INCONEL

*(Base prices f.o.b. mill)*

| | "A" Nickel | Monel | Inconel |
|---|---|---|---|
| Sheet, CR | 138 | 120 | 138 |
| Strip, CR | 124 | 108 | 138 |
| Rod, bar, HR | 107 | 89 | 109 |
| Angles, HR | 107 | 89 | 109 |
| Plates, HR | 130 | 110 | 126 |
| Seamless tube | 157 | 129 | 200 |
| Shot, blocks | ... | 87 | ... |

### COPPER, BRASS, BRONZE

*(Freight included in 5000 lbs)*

| | Sheet | Wire | Rod | Tube |
|---|---|---|---|---|
| Copper | 54.13 | ..... | 51.36 | 55.32 |
| Brass, Yellow | 48.10 | 48.39 | 48.04 | 52.26 |
| Brass, Low | 50.65 | 50.94 | 50.59 | 54.71 |
| Brass, Red | 51.54 | 51.83 | 51.48 | 55.60 |
| Brass, Naval | 52.86 | 59.17 | 46.67 | 57.02 |
| Muntz Metal | 50.94 | ..... | 46.25 | ..... |
| Comm. Bz. | 52.98 | 53.27 | 52.92 | 56.79 |
| Mang. Bz. | 56.80 | ..... | 50.20 | ..... |
| Phos. Bz. 5% | 54.59 | 74.34 | 75.09 | 76.52 |

Free Cutting Brass Rod..... 33.71

### TITANIUM

*(Base Prices f.o.b. mill)*

Sheet and strip, commercially pure, $6.75-$13.00; alloy, $13.40-$17. Plate, HR, commercially pure, $5.25-$9.00; alloy, $8.00-$10.00. Wire, rolled and/or drawn, commercially pure, $5.55-$6.05; alloy, $5.55-$9.00; bar, HR or forged, commercially pure, $4.00-$4.50; alloy, $4.00-$6.25; billets, HR, commercially pure, $3.20-$3.70; alloy, $3.20-$4.75.

## PRIMARY METAL

*(Cents per lb otherwise noted)*

Antimony, American, Laredo, Tex.. 32.50
Beryllium Aluminum 5% Be, Dollars per lb contained Be ..... $65.00
Beryllium copper, per lb conta'd Be. $43.00
Beryllium 97% lump or beads, f.o.b. Cleveland, Reading ..... $70.00
Bismuth, ton lots ..... $ 2.25
Cadmium, del'd ..... $ 1.70
Calcium, 99.9% small lots ..... $ 4.55
Chromium, 99.8% metallic base.... $ 1.31
Cobalt, 97-99% (per lb) ...$1.50 to $ 1.57
Germanium, per gm, f.o.b. Miami, Okla., refined ..... $29.95 to $36.95
Gold, U. S. Treas., per troy oz..... $35.00
Indium, 99.9% dollars per troy oz.. $ 2.25
Iridium, dollars per troy oz..... $75 to $85
Lithium, 98% ..... $9.00 to $12.00
Magnesium sticks, 10,000 lb..... 57.00
Mercury, dollars per 76-lb flask f.o.b. New York ..... $204 to $207
Nickel oxide sinter at Buffalo, N. Y., or other U. S. points of entry, contained nickel ..... 69.60
Palladium, dollars per troy oz...$24 to $26
Platinum, dollars per troy oz...$82 to $85
Rhodium ..... $137 to $140
Silver ingots (¢ per troy oz.) ..... 91.375
Thorium, per kg ..... $43.00
Vanadium ..... $ 3.65
Zirconium sponge ..... $ 5.00

## REMELTED METALS

### Brass Ingot

*(Cents per lb delivered, carloads)*

85-5-5 ingot
- No. 115 ..... 30.00
- No. 120 ..... 29.25
- No. 123 ..... 28.50

80-10-10 ingot
- No. 305 ..... 34.00
- No. 315 ..... 31.75

88-10-2 ingot
- No. 210 ..... 41.75
- No. 215 ..... 38.50
- No. 245 ..... 33.75

Yellow ingot
- No. 405 ..... 25.50

Manganese bronze
- No. 421 ..... 29.25

### Aluminum Ingot

*(Cents per lb del'd 30,000 lb and over)*

95-5 aluminum-silicon alloys
- 0.30 copper max. ..... 24.25-24.50
- 0.60 copper max. ..... 24.00-24.25

Piston alloys (No. 132 type)..26.00-27.00
No. 12 alum. (No. 2 grade)...22.75-23.25
108 alloy ..... 23.25-23.75
195 alloy ..... 25.75-26.75
13 alloy (0.60 copper max.)...24.00-24.25
AXS-679 (1 pct zinc) ..... 23.00-24.00

Steel deoxidizing aluminum notch bar granulated or shot
- Grade 1—95-97½% ..... 23.75-24.75
- Grade 2—92-95% ..... 22.50-23.50
- Grade 3—90-92% ..... 21.50-22.50
- Grade 4—85-90% ..... 21.00-22.00

## SCRAP METAL

### Brass Mill Scrap

*(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)*

| | Heavy | Turnings |
|---|---|---|
| Copper | 25 | 24¼ |
| Yellow brass | 19¼ | 17⅝ |
| Red brass | 22¼ | 21½ |
| Comm. bronze | 23 | 22¼ |
| Mang bronze | 18½ | 17⅝ |
| Free cutting rod ends. | 18⅝ | |

### Customs Smelters Scrap

*(Cents per pound carload lots, delivered to refinery)*

- No. 1 copper wire ..... 27
- No. 2 copper wire ..... 25¼
- Light copper ..... 23
- *Refining brass ..... 24
- Copper bearing material ..... 23

*Dry copper content.

### Ingot Makers Scrap

*(Cents per pound carload lots, delivered to refinery)*

- No. 1 copper wire ..... 27
- No. 2 copper wire ..... 25¼
- Light copper ..... 23
- No. 1 composition ..... 23
- No. 1 comp turnings ..... 22½
- Hvy yellow brass solids ..... 17
- Brass pipe ..... 16
- Radiators ..... 18

*Aluminum*

- Mixed old cast. ..... 12½—13
- Mixed new clips ..... 14½—15
- Mixed turnings, dry ..... 13½—14

### Dealers' Scrap

*(Dealers' buying price f.o.b. New York in cents per pound)*

**Copper and Brass**

- No. 1 copper wire ..... 23¾—24¼
- No. 2 copper wire ..... 22½—23¾
- Light copper ..... 19¾—20¼
- Auto radiators (unsweated).. 15½—16
- No. 1 composition ..... 19 —19½
- No. 1 composition turnings .. 18 —18½
- Cocks and faucets ..... 16 —16½
- Clean heavy yellow brass ... 12½—13
- Brass pipe ..... 16 —16½
- New soft brass clippings .... 15½—16
- No. 1 brass rod turnings .... 15½—16

**Aluminum**

- Alum. pistons and struts .... 7 — 7½
- Aluminum crankcase ..... 9½—10
- 1100 (2s) aluminum clippings 12¼—12¾
- Old sheet and utensils ..... 9½—10
- Borings and turnings ..... 4½— 5
- Industrial castings ..... 10 —10½
- 2020 (24s) clippings ..... 11 —11½

**Zinc**

- New zinc clippings ..... 5½— 5¾
- Old zinc ..... 3½— 4
- Zinc routings ..... 1¾— 2
- Old die cast scrap ..... 1¾— 2

**Nickel and Monel**

- Pure nickel clippings ..... 52-54
- Clean nickel turnings ..... 40
- Nickel anodes ..... 52-54
- Nickel rod ends ..... 52-54
- New Monel clippings ..... 23-23.50
- Clean Monel turnings ..... 16.50-17
- Old sheet Monel ..... 22-23
- Nickel silver clippings, mixed. 18
- Nickel silver turnings, mixed. 15

**Lead**

- Soft scrap lead ..... 7¼— 7¾
- Battery plates (dry) ..... 3 — 3¼
- Batteries, acid free ..... 2 — 2¼

**Miscellaneous**

- Block tin ..... 78 —79
- No. 1 pewter ..... 59 —60
- Auto babbitt ..... 44 —45
- Mixed common babbitt ..... 9½—10
- Solder joints ..... 14½—15
- Small foundry type ..... 8½— 9
- Monotype ..... 8¾— 9¼
- Lino. and stereotype ..... 8— 8¼
- Electrotype ..... 7½— 7¾
- Hand picked type shells ..... 5¼— 5¾
- Lino. and stereo. dross ..... 1¾— 2¼
- Electro dross ..... 2 — 2½

(Effective Apr. 24, 1961)

# STEEL PRICES

*Italics* identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

| | | BILLETS, BLOOMS, SLABS | | | PILING | SHAPES, STRUCTURALS | | | STRIP | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Carbon Rerolling Net Ton | Carbon Forging Net Ton | Alloy Net Ton | Sheet Steel | Carbon | Hi Str. Low Alloy | Carbon Wide-Flange | Hot-rolled | Cold-rolled | Hi Str. H.R. Low Alloy | Hi Str. C.R. Low Alloy | Alloy Hot-rolled | Alloy Cold-rolled |
| EAST | Bethlehem, Pa. | | | $119.00 *B3* | | 5.55 *B3* | 8.10 *B3* | 5.55 *B5* | | | | | | |
| | Buffalo, N. Y. | $80.00 *R3, B3* | $99.50 *R3, B3* | $119.00 *R3, B3* | 6.50 *B3* | 5.55 *B3* | 8.10 *B3* | 5.55 *B3* | 5.10 *B3,* | 7.425 *S10, R7* | 7.575 *B3* | | | |
| | Phila., Pa. | | | | | | | | | 7.875 *P15* | | | | |
| | Harrison, N. J. | | | | | | | | | | | | | 15.55 *C11* |
| | Conshohocken, Pa. | | $99.50 *A2* | $121.00 *A2* | | | | | 5.15 *A2* | | 7.575 *A2* | | | |
| | New Bedford, Mass. | | | | | | | | | 7.875 *R6* | | | | |
| | Johnstown, Pa. | $80.00 *B3* | $99.50 *B3* | $119.00 *B3* | | 5.55 *B3* | 8.10 *B3* | | | | | | | |
| | Boston, Mass. | | | | | | | | | 7.975 *T8* | | | | 15.90 *T8* |
| | New Haven, Conn. | | | | | | | | | 7.875 *D1* | | | | |
| | Baltimore, Md. | | | | | | | | | 7.425 *T8* | | | | 15.90 *T8* |
| | Phoenixville, Pa. | | | | | 5.55 *P2* | 8.10 *P2* | 5.55 *P2* | | | | | | |
| | Sparrows Pt., Md. | | | | | | | | 5.10 *B3* | | 7.575 *B3* | | | |
| | New Britain, Wallingford, Conn. | | | $119.00 *N8* | | | | | | 7.875 *W1,S7* | | | | |
| | Pawtucket, R. I. Worcester, Mass. | | | | | | | | | 7.975 *N7, A5* | | | | 15.90 *N7* 15.70 *T8* |
| MIDDLE WEST | Alton, Ill. | | | | | | | | 5.30 *L1* | | | | | |
| | Ashland, Ky. | | | | | | | | 5.10 *A7* | | 7.575 *A7* | | | |
| | Canton-Massillon, Dover, Ohio | | $102.00 *R3* | $119.00 *R3, T5* | | | | | | 7.425 *G4* | | 10.80 *G4* | | |
| | Chicago, Franklin Park, Evanston, Ill. | $80.00 *U1, R3* | $99.50 *U1, R3,W8* | $119.00 *U1, R3,W8* | 6.50 *U1* | 5.50 *U1, W8,P13* | 8.05 *U1, Y1,W8* | 5.50 *U1* | 5.10 *W8, N4,A1* | 7.425 *A1,T8, M8* 7.525* *M8* | 7.575 *W8* | | 8.40 *W8, S9,I3* | 15.55 *A1, S9,G4,T8* |
| | Cleveland, Ohio | | | | | | | | | 7.425 *A5* | | 10.75 *A5* | 8.40 *J3* | 15.60 *N7* |
| | Detroit, Mich. | | | $119.00 *R5* | | | | | 5.10 *G3, M2* | 7.425 *M2, S1, D1, P11, B9* | 7.575 *G3* | 10.80 *S1* | | |
| | Anderson, Ind. | | | | | | | | | 7.425 *G4* | | | | |
| | Gary, Ind. Harbor, Indiana | $80.00 *U1* | $99.50 *U1* | $119.00 *U1, Y1* | | 5.50 *U1, I3, Y1* | 8.05 *U1, J3* | 5.50 *I3* | 5.10 *U1, I3,Y1* | 7.425 *Y1* | 7.575 *U1, I3,Y1* | 10.90 *Y1* | 8.40 *U1, Y1* | |
| | Sterling, Ill. | $80.00 *N4* | | | | 5.50 *N4* | 7.75 *N4* | 5.50 *N4* | 5.20 *N4* | | | | | |
| | Indianapolis, Ind. | | | | | | | | | 7.575 *R5* | | | | 15.70 *R5* |
| | Newport, Ky. | | | | | | | | 5.10 *A9* | | | | 8.40 *A9* | |
| | Niles, Warren, Struthers, Ohio Sharon, Pa. | | $99.50 *S1, C10* | $119.00 *C10,S1* | | 5.50 *Y1* | | | 5.10 *R3, S1* | 7.425 *R3, T4,S1* | 7.575 *R3, S1* | 10.80 *R3, S1* | 8.40 *S1* | 15.55 *S1* |
| | Owensboro, Ky. | $80.00 *G5* | $99.50 *G5* | $119.00 *G5* | | | | | | | | | | |
| | Pittsburgh, Midland, Butler, Aliquippa, N. Castle, McKeesport, Pa. | $80.00 *U1, P6* | $99.50 *U1 C11,P6* | $119.00 *U1, C11,E7* | 6.50 *U1* | 5.50 *U1, J3* | 8.05 *U1, J3* | 5.50 *U1* | 5.10 *P6* | 7.425 *B4, M10* 7.525 *E3* | | | 8.40 *S9* | 15.55 *S9* 15.60 *N7* |
| | Weirton, Wheeling, Follansbee, W. Va. | | | | 6.50 *U1, W3* | 5.50 *W3* | | 5.50 *W3* | 5.10 *W3* | 7.425 *W5* | 7.575 *W3* | 10.80 *W3* | | |
| | Youngstown, Ohio | $80.00 *R3* | $99.50 *Y1, C10* | $119.00 *Y1* | | | 8.05 *Y1* | | 5.10 *U* | 7.425 *Y1,R5* | 7.575 *U1, Y1* | 10.95 *Y1* | 8.40 *U1, Y1* | 15.55 *R5, Y1* |
| WEST | Fontana, Cal. | $90.50 *K1* | $109.00 *K1* | $140.00 *K1* | | 6.30 *K1* | 8.85 *K1* | 6.45 *K1* | 5.825 *K1* | 9.20 *K1* | | | | |
| | Geneva, Utah | | $99.50 *C7* | | | 5.50 *C7* | 8.05 *C7* | | | | | | | |
| | Kansas City, Mo. | | | | | 5.60 *S2* | 8.15 *S2* | | | | | | 8.65 *S2* | |
| | Los Angeles, Torrance, Cal. | | $109.00 *B2* | $139.00 *B2* | | 6.20 *C7, B2* | 8.75 *B2* | | 5.85 *C7, B2* | 9.30 *C1,R5* | | | 9.60 *B2* | 17.75 *J3* |
| | Minnequa, Colo. | | | | | 5.80 *C6* | | | 6.20 *C6* | 9.375 *C6* | | | | |
| | Portland, Ore. | | | | | 6.25 *O2* | | | | | | | | |
| | San Francisco, Niles, Pittsburg, Cal. | | $109.00 *B2* | | | 6.15 *B2* | 8.70 *B2* | | 5.85 *C7, B2* | | | | | |
| | Seattle, Wash. | | $109.00 *B2* | $140.00 *B2* | | 6.25 *B2* | 8.80 *B2* | | 6.10 *B2* | | | | | |
| SOUTH | Atlanta, Ga. | | | | | 5.70 *A8* | | | 5.10 *A8* | | | | | |
| | Fairfield, City, Ala. Birmingham, Ala. | $80.00 *T2* | $99.50 *T2* | | | 5.50 *T2 R3,C16* | 8.05 *T2* | | 5.10 *T2, R3,C16* | | 7.575 *T2* | | | |
| | Houston, Lone Star, Texas | | $104.50 *S2* | $124.00 *S2* | | 5.60 *S2* | 8.15 *S2* | | | | | | 8.65 *S2* | |

* Electro-galvanized-plus galvanizing extras.

(Effective Apr. 24, 1961)

IRON AGE

# STEEL PRICES

*Italics* identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

| | | SHEETS | | | | | | | | WIRE ROD | TINPLATE† | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Hot-rolled *18* ga. & hvyr. | Cold-rolled | Galvanized (Hot-dipped) | Enameling | Long Terne | Hi Str. Low Alloy H.R. | Hi Str. Low Alloy C.R. | Hi Str. Low Alloy Galv. | | Cokes* *1.25*-lb. base box | Electro** *0.25*-lb. base box | Thin *0.25* lb. coating in coils |
| EAST | Buffalo, N. Y. | 5.10 *B3* | 6.275 *B3* | | | | 7.525 *B3* | 9.275 *B3* | | 6.40 *W6* | † Special coated mfg. terne deduct 35¢ from 1.25-lb. coke base box price 0.75 lb. 0.25 lb. add 55¢. Can-making quality BLACKPLATE 55 to 128 lb. deduct $2.20 from 1.25 lb. coke base box. * COKES: 1.50-lb. add 25¢. **ELECTRO: 0.50-lb. add 25¢; 0.75-lb. add 65¢; 1.00-lb. add $1.00. Differential 1.00 lb. 0.25 lb. add 65¢. | | Prices are for 50 lb. base box; for 45 lb. deduct 15¢; for 55 lb. add 15¢; for 60 lb. add 30¢. |
| | Claymont, Del. | | | | | | | | | | | | |
| | Coatesville, Pa. | | | | | | | | | | | | |
| | Conshohocken, Pa. | 5.15 *A2* | 6.325 *A2* | | | | 7.575 *A2* | | | | | | |
| | Harrisburg, Pa. | | | | | | | | | | | | |
| | Hartford, Conn. | | | | | | | | | | | | |
| | Johnstown, Pa. | | | | | | | | | 6.40 *B3* | | | |
| | Fairless, Pa. | 5.15 *U1* | 6.325 *U1* | | | | 7.575 *U1* | 9.325 *U1* | | | | $9.10 *U1* | $6.25 *U1* |
| | New Haven, Conn. | | | | | | | | | | | | |
| | Phoenixville, Pa. | | | | | | | | | | | | |
| | Sparrows Pt., Md. | 5.10 *B3* | 6.275 *B3* | 6.875 *B3* | 6.775 *B3* | | 7.525 *B3* | 9.275 *B3* | 10.025 *B3* | 6.50 *B3* | $10.40 *B3* | $9.10 *B3* | $6.25 *B3* |
| | Worcester, Mass. | | | | | | | | | 6.70 *A5* | | | |
| MIDDLE WEST | Alton, Ill. | | | | | | | | | 6.60 *L1* | Holloware Enameling 29 ga.—7.85 *U1* at Gary; Pittsburgh; *J3* at Aliquippa; *W5* at Yorkville; *Y1* at Indiana Harbor; *W5* at Wheeling; 7.95 *G2* at Granite City. | | |
| | Ashland, Ky. | 5.10 *A7* | | 6.875 *A7* | 6.775 *A7* | | 7.525 *A7* | | | | | | |
| | Canton-Massillon, Dover, Ohio | | | 6.875 *R1, R3* | | | | | | | | | |
| | Chicago, Joliet, Ill. | 5.10 *W8, A1* | | | | | 7.525 *U1, W8* | | | 6.40 *A5, R3, W8* | | | |
| | Sterling, Ill. | | | | | | | | | 6.50 *N4, K2* | | | |
| | Cleveland, Ohio | 5.10 *R3, J3* | 6.275 *R3, J3* | 7.65 *R3** | 6.775 *R3* | | 7.525 *R3, J3* | 9.275 *R3, J3* | | 6.40 *A5* | | | |
| | Detroit, Mich. | 5.10 *G3, M2* | 6.275 *G3, M2* | | | | 7.525 *G3* | 9.275 *G3* | | | | | |
| | Newport, Ky. | 5.10 *A9* | 6.275 *A9* | | | | | | | | | | |
| | Gary, Ind. Harbor, Indiana | 5.10 *U1, I3, Y1* | 6.275 *U1, I3, Y1* | 6.875 *U1, I3* | 6.775 *U1, I3, Y1* | 7.225 *U1* | 7.525 *U1, Y1, I3* | 9.275 *U1, Y1* | | 6.40 *Y1* | $10.40 *U1, Y1* | $9.10 *I3, U1, Y1* | $6.25 *U1, I3* |
| | Granite City, Ill. | 5.20 *G2* | 6.375 *G2* | 6.975 *G2* | | | | | | | | $9.20 *G2* | |
| | Kokomo, Ind. | | | 6.975 *C9* | | | | | | 6.50 *C9* | | | |
| | Mansfield, Ohio | 5.10 *E2* | 6.275 *E2* | | | 7.225 *E2* | | | | | | | |
| | Middletown, Ohio | | 6.275 *A7* | 6.875 *A7* | 6.775 *A7* | 7.225 *A7* | | | | | | | |
| | Niles, Warren, Ohio Sharon, Pa. | 5.10 *R3, S1* | 6.275 *R3* | 6.875 *R3* 7.65 *R3** | 6.775 *S1* | 7.225 *S1*†† *R3* | 7.525 *R3, S1* | 9.275 *R3* | | | | $9.10 *R3* | |
| | Pittsburgh, Midland, Butler, Aliquippa, McKeesport, Pa. | 5.10 *U1, J3, P6* | 6.275 *U1, J3, P6* | 6.875 *U1, J3* 7.50 *E3** | 6.775 *U1* | | 7.525 *U1, J3* | 9.275 *U1, J3* | 10.025 *U1, J3* | 6.40 *A5, J3, P6* | $10.40 *U1, J3* | $9.10 *U1, J3* | $6.25 *U1* |
| | Portsmouth, Ohio | 5.10 *P7* | 6.275 *P7* | | | | | | | 6.40 *P7* | | | |
| | Weirton, Wheeling, Follansbee, W. Va. | 5.10 *W3, W5* | 6.275 *W3, F3, W5* | 6.875 *W3, W5* 7.50 *W3** | | 7.225 *W5* | 7.525 *W3* | 9.275 *W3* | | | $10.40 *W5, W3* | $9.10 *W5, W3* | $6.40 *W5*** $6.25 *W3* |
| | Youngstown, Ohio | 5.10 *U1, Y1* | 6.275 *Y1* | | 6.775 *Y1* | | 7.525 *Y1* | 9.275 *Y1* | | 6.40 *Y1* | | | |
| WEST | Fontana, Cal. | 5.825 *K1* | 7.40 *K1* | | | | 8.25 *K1* | 10.40 *K1* | | | $11.05 *K1* | $9.75 *K1* | |
| | Geneva, Utah | 5.20 *C7* | | | | | | | | | | | |
| | Kansas City, Mo. | | | | | | | | | 6.65 *S2* | | | |
| | Los Angeles, Torrance, Cal. | | | | | | | | | 7.20 *B2* | | | |
| | Minnequa, Colo. | | | | | | | | | 6.65 *C6* | | | |
| | San Francisco, Niles, Pittsburg, Cal. | 5.80 *C7* | 7.225 *C7* | 7.625 *C7* | | | | | | 7.20 *C7* | $11.05 *C7* | $9.75 *C7* | |
| SOUTH | Atlanta, Ga. | | | | | | | | | | | | |
| | Fairfield, Ala. Alabama City, Ala. | 5.10 *T2, R3* | 6.275 *T2, R3* | 6.875 *T2, R3* | 6.775 *T2* | | | | | 6.40 *T2, R3* | $10.40 *T2* | $9.10 *T2* | $6.25 *T2* |
| | Houston, Texas | | | | | | | | | 6.65 *S2* | | | |

* Electrogalvanized sheets. ** For 55 lb.; for 60 lb. add 15¢.

†† 7.425 at Sharon; Niles is 7.225.

(Effective Apr. 24, 1961)

IRON AGE

# STEEL PRICES

*Italics* identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

| | | BARS | | | | | | PLATES | | | | WIRE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Carbon† Steel | Reinforcing | Cold Finished | Alloy Hot-rolled | Alloy Cold Drawn | Hi Str. H.R. Low Alloy | Carbon Steel | Floor Plate | Alloy | Hi Str. Low Alloy | Mfr's. Bright |
| EAST | Bethlehem, Pa. | | | | 6.725 *B3* | 9.025 *B3* | 8.30 *B3* | | | | | |
| | Buffalo, N. Y. | 5.675 *R3,B3* | 5.675 *R3,B3* | 7.70 *B5* | 6.725 *B3,R3* | 9.025 *B3,B5* | 8.30 *B3* | 5.30 *B3* | | | | 8.00 *W6* |
| | Claymont, Del. | | | | | | | 5.30 *P2* | 6.375 *P2* | 7.50 *P2* | 7.95 *P2* | |
| | Coatesville, Pa. | | | | | | | 5.30 *L4* | | 7.50 *L4* | 7.95 *L4* | |
| | Conshohocken, Pa. | | | | | | | 5.30 *A2* | 6.375 *A2* | 7.50 *A2* | 7.95 *A2* | |
| | Milton, Pa. | 5.825 *M7* | 5.825 *M7* | | | | | | | | | |
| | Hartford, Conn. | | | 8.15 *R3* | | 9.325 *R3* | | | | | | |
| | Johnstown, Pa. | 5.675 *B3* | 5.675 *B3* | | 6.725 *B3* | | 8.30 *B3* | 5.30 *B3* | | 7.50 *B3* | 7.95 *B3* | 8.00 *B3* |
| | Steelton, Pa. | | 5.675 *B3* | | | | | | | | | |
| | Fairless, Pa. | 5.825 *U1* | 5.825 *U1* | | | | | | | | | |
| | Newark, Camden, N. J. | | | 8.10 *W10, P10* | | 9.20 *W10, P10* | | | | | | |
| | Bridgeport, Putnam, Willimantic, Conn. | | | 8.20 *W10* 8.15 *J3* | 6.80 *N8* | 9.175 *N8* | | | | | | |
| | Sparrows Pt., Md. | | 5.675 *B3* | | | | | 5.30 *B3* | | 7.50 *B3* | 7.95 *B3* | 8.10 *B3* |
| | Palmer, Worcester, Readville, Manafield, Mass. | | | 8.20 *B5, C14* | | 9.325 *A5,B5* | | | | | | 8.30 *A5, W6* |
| | Spring City, Pa. | | | 8.10 *K4* | | 9.20 *K4* | | | | | | |
| MIDDLE WEST | Alton, Ill. | 5.875 *L1* | | | | | | | | | | 8.20 *L1* |
| | Ashland, Newport, Ky. | | | | | | | 5.30 *A7,A9* | | 7.50 *A9* | 7.95 *A7* | |
| | Canton, Massillon, Manafield, Ohio | 6.15* *R3* | | 7.65 *R3,R2* | 6.725 *R3, T5* | 9.025 *R3,R2, T5* | | 5.30 *E2* | | | | |
| | Chicago, Joliet, Waukegan, Madison, Harvey, Ill. | 5.675 *U1,R3, W8,N4,P13* | 5.675 *U1,R3, N4,P13,W8* 5.875 *L1* | 7.65 *A5, W10,W8, B5,L2,N9* | 6.725 *U1,R3, W8* | 9.025 *A5, W10,W8, L2,N8,B5* | 8.30 *U1,W8, R3* | 5.30 *U1,A1, W8,13* | 6.375 *U1* | 7.50 *U1, W8* | 7.95 *U1, W8* | 8.00 *A5,R3, W8,N4, K2,W7* |
| | Cleveland, Elyria, Ohio | 5.675 *R3* | 5.675 *R3* | 7.65 *A5,C13, C18* | | 9.025 *A5, C13,C18* | 8.30 *R3* | 5.30 *R3,J3* | 6.375 *J3* | | 7.95 *R3,J3* | 8.00 *A5, C13,C18* |
| | Detroit, Plymouth, Mich. | 5.675 *G3* | 5.675 *G3* | 7.90 *P3* 7.85 *P8B5H2* 7.65 *R5* | 6.725 *R5,G3* | 9.025 *R5,P8, H2* 9.225 *B5,P3* | 8.30 *G3* | 5.30 *G3* | | 7.50 *G3* | 7.95 *G3* | |
| | Duluth, Minn. | | | | | | | | | | | 8.00 *A5* |
| | Gary, Ind. Harbor, Crawfordsville, Hammond, Ind. | 5.675 *U1,I3, Y1* | 5.675 *U1,I3, Y1* | 7.65 *R3,J3* | 6.725 *U1,I3, Y1* | 9.025 *R3,M4* | 8.30 *U1,Y1* | 5.30 *U1,I3, Y1* | 6.375 *J3, Y1* | 7.50 *U1, Y1* | 7.95 *U1, Y1,I3* | 8.10 *M4* |
| | Granite City, Ill. | | | | | | | 5.40 *G2* | | | | |
| | Kokomo, Ind. | | 5.775 *C9* | | | | | | | | | 8.10 *C9* |
| | Sterling, Ill. | 5.775 *N4* | 5.775 *N4* | | | | 7.925 *N4* | 5.30 *N4* | | | 7.625 *N4* | 8.10 *K2* |
| | Niles, Warren, Ohio Sharon, Pa. | | | 7.65 *C10* | 6.725 *C10,* | 9.025 *C10* | | 5.30 *R3,S1* | | 7.50 *S1* | 7.95 *R3, S1* | |
| | Owensboro, Ky. | 5.675 *G5* | | | 6.725 *G5* | | | | | | | |
| | Pittsburgh, Midland, Donora, Aliquippa, Pa. | 5.675 *U1,J3* | 5.675 *U1,J3* | 7.65 *A5,B4, R3,J3,C11, W10,S9,C8, M9* | 6.725 *U1,J3, C11,B7* | 9.025 *A5, W10,R3,S9, C11,C8,M9* | 8.30 *U1,J3* | 5.30 *U1,J3* | 6.375 *U1,J3* | 7.50 *U1, J3,B7* | 7.95 *U1, J3,B7* | 8.00 *A5, J3,P6* |
| | Portsmouth, Ohio | | | | | | | | | | | 8.00 *P7* |
| | Youngstown, Steubenville, O. | 5.675 *U1,R3, Y1* | 5.675 *U1,R3, Y1* | 7.65 *A1,Y1, F2* | 6.725 *U1,Y1* | 9.025 *Y1,F2* | 8.30 *U1,Y1* | 5.30 *U1,W5, R3,Y1* | | 7.50 *Y1* | 7.95 *U1,Y1* | 8.00 *Y1* |
| WEST | Emeryville, Fontana, Cal. | 6.425 *J5* 6.375 *K1* | 6.425 *J5* 6.375 *K1* | | 7.775 *K1* | | 9.00 *K1* | 6.10 *K1* | | 8.30 *K1* | 8.75 *K1* | |
| | Geneva, Utah | | | | | | | 5.30 *C7* | | | 7.95 *C7* | |
| | Kansas City, Mo. | 5.925 *S2* | 5.675 *S2* | | 6.975 *S2* | | 8.55 *S2* | | | | | 8.25 *S2* |
| | Los Angeles, Torrance, Cal. | 6.375 *C7,B2* | 6.375 *C7,B2* | 9.10 *R3,P14, S12* | 7.775 *B2* | 11.00 *P14, B5* | 9.00 *B2* | | | | | 8.95 *B2* |
| | Minnequa, Colo. | 6.125 *C6* | 6.125 *C6* | | | | | 6.15 *C6* | | | | 8.25 *C6* |
| | Portland, Ore. | 6.425 *O2* | 6.425 *O2* | | | | | | | | | |
| | San Francisco, Niles, Pittsburg, Cal. | 6.375 *C7* 6.425 *B2* | 6.375 *C7* 6.425 *B2* | | | | 9.05 *B2* | | | | | 8.95 *C7,C6* |
| | Seattle, Wash. | 6.425 *B2,N6, A10* | 6.425 *B2,A10* | | 7.825 *B2* | | 9.05 *B2* | 6.20 *B2* | | 8.40 *B2* | 8.85 *B2* | |
| SOUTH | Atlanta, Ga. Jacksonville, Fla. | 5.875 *A8* | 5.00 *A8* | | | | | | | | | 8.00 *A8* 8.35 *M4* |
| | Fairfield City, Ala. Birmingham, Ala. | 5.675 *T2,R3, C16* | 5.675 *T2,R3, C16* | 8.25 *C16* | | | 8.30 *T2* | 5.30 *T2,R3* | | | 7.95 *T2* | 8.00 *T2,R3* |
| | Houston, Ft. Worth, Lone Star, Texas, Sand Springs, Okla. | 5.925 *S2* | 5.675 *S2* | | 6.975 *S2* | | 8.55 *S2* | 5.40 *S2* | | 7.60 *S2* | 8.05 *S2* | 8.25 *S2* |

† Merchant Quality—Special Quality 35¢ higher. (Effective Apr. 24, 1961) * Special Quality.

# STEEL PRICES

## Key to Steel Producers

### With Principal Offices

*A1* Acme Steel Co., Chicago
*A2* Alan Wood Steel Co., Conshohocken, Pa.
*A3* Allegheny Ludlum Steel Corp., Pittsburgh
*A4* American Cladmetals Co., Carnegie, Pa.
*A5* American Steel & Wire Div., Cleveland
*A6* Angel Nail & Chaplet Co., Cleveland
*A7* Armco Steel Corp., Middletown, Ohio
*A8* Atlantic Steel Co., Atlanta, Ga.
*A9* Acme-Newport Steel Co., Newport, Ky.
*A10* Alaska Steel Mills, Inc., Seattle, Wash.

*B1* Babcock & Wilcox Tube Div., Beaver Falls, Pa.
*B2* Bethlehem Steel Co., Pacific Coast Div.
*B3* Bethlehem Steel Co., Bethlehem, Pa.
*B4* Blair Strip Steel Co., New Castle, Pa.
*B5* Bliss & Laughlin, Inc., Harvey, Ill.
*B6* Brooke Plant, Wickwire-Spencer Steel Div., Birdsboro, Pa.
*B7* A. M. Byers, Pittsburgh
*B8* Braeburn Alloy Steel Corp., Braeburn, Pa.
*B9* Barry Universal Corp., Detroit, Mich.

*C1* Calstrip Steel Corp., Los Angeles
*C2* Carpenter Steel Co., Reading, Pa.
*C6* Colorado Fuel & Iron Corp., Denver
*C7* Columbia Geneva Steel Div., San Francisco
*C8* Columbia Steel & Shafting Co., Pittsburgh
*C9* Continental Steel Corp., Kokomo, Ind.
*C10* Copperweld Steel Co., Pittsburgh, Pa.
*C11* Crucible Steel Co. of America, Pittsburgh
*C13* Cuyahoga Steel & Wire Co., Cleveland
*C14* Compressed Steel Shafting Co., Readville, Mass.
*C15* G. O. Carlson, Inc., Thorndale, Pa.
*C16* Connors Steel Div., Birmingham
*C18* Cold Drawn Steel Plant, Western Automatic Machine Screw Co., Elyria, O.

*D1* Detroit Steel Corp., Detroit
*D2* Driver, Wilbur B., Co., Newark, N. J.
*D3* Driver Harris Co., Harrison, N. J.
*D4* Dickson Weatherproof Nail Co., Evanston, Ill.

*E1* Eastern Stainless Steel Corp., Baltimore
*E2* Empire-Reeves Steel Corp., Mansfield, O.
*E3* Enamel Products & Plating Co., McKeesport, Pa.

*F1* Firth Sterling, Inc., McKeesport, Pa.
*F2* Fitzsimons Steel Corp., Youngstown
*F3* Follansbee Steel Corp., Follansbee, W. Va.

*G2* Granite City Steel Co., Granite City, Ill.
*G3* Great Lakes Steel Corp., Detroit
*G4* Greer Steel Co., Dover, O.
*G5* Green River Steel Corp., Owenboro, Ky.

*H1* Hanna Furnace Corp., Detroit
*H2* Hercules Drawn Steel Corp., Toledo, O.

*I2* Ingersoll Steel Div., New Castle, Ind.
*I3* Inland Steel Co., Chicago, Ill.
*I4* Interlake Iron Corp., Cleveland

*J1* Jackson Iron & Steel Co., Jackson, O.
*J2* Jessop Steel Corp., Washington, Pa.
*J3* Jones & Laughlin Steel Corp., Pittsburgh
*J4* Joslyn Mfg. & Supply Co., Chicago
*J5* Judson Steel Corp., Emeryville, Calif.

*K1* Kaiser Steel Corp., Fontana, Calif.
*K2* Keystone Steel & Wire Co., Peoria
*K4* Keystone Drawn Steel Co., Spring City, Pa.

*L1* Laclede Steel Co., St. Louis
*L2* La Salle Steel Co., Chicago
*L3* Lone Star Steel Co., Dallas
*L4* Lukens Steel Co., Coatesville, Pa.

*M1* Mahoning Valley Steel Co., Niles, O.
*M2* McLouth Steel Corp., Detroit
*M3* Mercer Tube & Mfg. Co., Sharon, Pa.
*M4* Mid States Steel & Wire Co., Crawfordsville, Ind.
*M7* Milton Steel Products Div., Milton, Pa.
*M8* Mill Strip Products Co., Evanston, Ill.
*M9* Moltrup Steel Products Co., Beaver Falls, Pa.
*M10* Mill Strip Products Co., of Pa., New Castle, Pa.

*N1* National Supply Co., Pittsburgh
*N2* National Tube Div., Pittsburgh
*N4* Northwestern Steel & Wire Co., Sterling, Ill.
*N6* Northwest Steel Rolling Mills, Seattle
*N7* Newman Crosby Steel Co., Pawtucket, R. I.
*N8* Carpenter Steel of New England, Inc., Bridgeport, Conn.
*N9* Nelson Steel & Wire Co.

*O1* Oliver Iron & Steel Co., Pittsburgh
*O2* Oregon Steel Mills, Portland

*P1* Page Steel & Wire Div., Monessen, Pa.
*P2* Phoenix Steel Corp., Phoenixville, Pa.
*P3* Pilgrim Drawn Steel Div., Plymouth, Mich.
*P4* Pittsburgh Coke & Chemical Co., Pittsburgh
*P6* Pittsburgh Steel Co., Pittsburgh
*P7* Portsmouth Div., Detroit Steel Corp., Detroit
*P8* Plymouth Steel Co., Detroit
*P9* Pacific States Steel Co., Niles, Cal.
*P10* Precision Drawn Steel Co., Camden, N. J.
*P11* Production Steel Strip Corp., Detroit
*P13* Phoenix Mfg. Co., Joliet, Ill.
*P14* Pacific Tube Co.
*P15* Philadelphia Steel and Wire Corp.

*R1* Reeves Steel & Mfg. Div., Dover, O.
*R2* Reliance Div., Eaton Mfg. Co., Massillon, O.
*R3* Republic Steel Corp., Cleveland
*R4* Roebling Sons Co., John A., Trenton, N. J.
*R5* Jones & Laughlin Steel Corp., Stainless and Strip Div.
*R6* Rodney Metals, Inc., New Bedford, Mass.
*R7* Rome Strip Steel Co., Rome, N. Y.

*S1* Sharon Steel Corp., Sharon, Pa.
*S2* Sheffield Steel Div., Kansas City
*S3* Shenango Furnace Co., Pittsburgh
*S4* Simonds Saw and Steel Co., Fitchburg, Mass.
*S5* Sweet's Steel Co., Williamsport, Pa.
*S7* Stanley Works, New Britain, Conn.
*S8* Superior Drawn Steel Co., Monaca, Pa.
*S9* Superior Steel Div. of Copperweld Steel Co.
*S10* Seneca Steel Service, Buffalo
*S11* Southern Electric Steel Co., Birmingham
*S12* Sierra Drawn Div., Bliss & Laughlin, Inc., Los Angeles, Calif.
*S13* Seymour Mfg. Co., Seymour, Conn.
*S14* Screw and Bolt Corp. of America, Pittsburgh, Pa.

*T1* Tonawanda Iron Div., N. Tonawanda, N. Y.
*T2* Tennessee Coal & Iron Div., Fairfield
*T3* Tennessee Products & Chem. Corp., Nashville
*T4* Thomas Strip Div., Warren, O.
*T5* Timken Steel & Tube Div., Canton, O.
*T7* Texas Steel Co., Fort Worth
*T8* Thompson Wire Co., Boston

*U1* United States Steel Corp., Pittsburgh
*U2* Universal-Cyclops Steel Corp., Bridgeville, Pa.
*U3* Ulbrich Stainless Steels, Wallingford, Conn.
*U4* U. S. Pipe & Foundry Co., Birmingham

*W1* Wallingford Steel Co., Wallingford, Conn.
*W2* Washington Steel Corp., Washington, Pa.
*W3* Weirton Steel Co., Weirton, W. Va.
*W4* Wheatland Tube Co., Wheatland, Pa.
*W5* Wheeling Steel Corp., Wheeling, W. Va.
*W6* Wickwire Spencer Steel Div., Buffalo
*W7* Wilson Steel & Wire Co., Chicago.
*W8* Wisconsin Steel Div., S. Chicago, Ill.
*W9* Woodward Iron Co., Woodward, Ala.
*W10* Wyckoff Steel Co., Pittsburgh
*W12* Wallace Barnes Steel Div., Bristol, Conn.

*Y1* Youngstown Sheet & Tube Co., Youngstown, O.

## STEEL SERVICE CENTER PRICES

Metropolitan Price, dollars per 100 lb.

| Cities | City Delivery‡ Charge | Sheets | | | Strip | Plates | Shapes | Bars | | Alloy Bars | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Hot-Rolled (18 ga. & hvr.) | Cold-Rolled (15 gage) | Galvanized (10 gage)†† | Hot-Rolled | | Standard Structural | Hot-Rolled (merchant) | Cold-Finished | Hot-Rolled 4615 As rolled | Hot-Rolled 4140 Annealed | Cold-Drawn 4615 As rolled | Cold-Drawn 4140 Annealed |
| Atlanta | | 9.37 | 10.61 | 11.83 | 10.85 | 9.73 | 9.94 | 9.53 | 13.24 | ..... | ..... | ..... | ..... |
| Baltimore | $.10 | 7.87 | 9.71 | 10.16 | 11.35 | 9.70 | 9.95 | 8.65 | 11.80 | 17.48 | 16.48 | 21.58 | 20.83 |
| Birmingham | | 8.46 | 10.20 | 10.59 | 9.45 | 8.41 | 8.47 | 8.26 | 13.14 | 16.76 | 16.65 | ..... | ..... |
| Boston | .10 | 9.84 | 10.68 | 11.87 | 12.26 | 9.72 | 10.26 | 9.87 | 13.45 | 17.79 | 16.79 | 21.89 | 21.14 |
| Buffalo | .15 | 8.70 | 9.45 | 11.40 | 11.15 | 8.80 | 9.30 | 8.90 | 11.60 | 17.45 | 16.45 | 21.55 | 20.80 |
| Chicago** | .15 | 9.37 | 10.35 | 10.85 | 11.54 | 9.21 | 9.72 | 9.37 | 10.80 | 17.10 | 16.10 | 21.20 | 20.45 |
| Cincinnati** | .15 | 9.53 | 10.41 | 10.90 | 11.86 | 9.59 | 10.29 | 9.48 | 11.68 | 17.42 | 16.42 | 21.52 | 20.77 |
| Cleveland** | .15 | 9.37[1] | 10.81 | 11.07 | 11.66 | 9.45 | 10.11 | 9.69 | 11.40 | 17.21 | 16.21 | 21.31 | 20.56 |
| Denver | | 11.55 | 12.53 | 13.03 | 13.72 | 11.39 | 11.90 | 11.55 | 12.98 | ..... | ..... | ..... | 20.84 |
| Detroit** | .15 | 9.63 | 10.61 | 11.20 | 11.91 | 9.58* | 10.29 | 9.68 | 11.16 | 17.38 | 16.38 | 21.48 | 20.73 |
| Houston** | | 10.17 | 10.98 | 11.35[3] | 11.73 | 9.41 | 9.81 | 9.58 | 13.10 | 17.50 | 16.55 | 21.55 | 20.85 |
| Kansas City | .15 | 10.53 | 11.37 | 10.95 | 12.70 | 10.39 | 10.91 | 10.55 | 11.72 | 17.17 | 15.87 | 21.87 | 21.12 |
| Los Angeles | | 10.35[1] | 11.20 | 12.20 | 12.40 | 10.30 | 10.45 | 10.25 | 14.20 | 18.30 | 17.35 | 22.90 | 22.20 |
| Memphis | .15 | 9.13 | 10.50 | 10.95 | 11.44 | 9.47 | 9.82 | 8.97 | 12.89 | ..... | ..... | ..... | ..... |
| Milwaukee** | .15 | 9.51 | 10.49 | 10.99 | 11.68 | 9.35 | 9.94 | 9.51 | 11.04 | 17.24 | 16.24 | 21.24 | 20.49 |
| New York | .10 | 9.77 | 10.23 | 11.45 | 11.56 | 9.61 | 10.30 | 9.84 | 13.35 | 17.50 | 16.50 | 21.60 | 20.85 |
| Norfolk | .20 | 8.20 | ..... | ..... | 8.90 | 8.65 | 9.20 | 8.90 | 10.70 | ..... | ..... | ..... | ..... |
| Philadelphia | .10 | 9.90 | 10.10 | 10.76 | 11.35 | 9.70 | 9.95 | 9.75 | 12.05 | 17.48 | 16.48 | 21.58 | 20.83 |
| Pittsburgh** | .15 | 9.37 | 10.81 | 11.83 | 11.64 | 9.21 | 9.72 | 9.37 | 11.40 | 17.10 | 16.10 | 21.20 | 20.45 |
| Portland | | 9.45 | 11.30 | 12.35 | 12.40 | 10.55 | 11.00 | 9.45 | 16.65 | 18.60 | 17.85 | 22.70 | 22.15 |
| San Francisco | .10 | 10.27 | 11.79[2] | 11.50 | 11.88 | 10.48 | 10.50 | 10.17 | 15.20 | 18.30 | 17.35 | 22.90 | 22.20 |
| Seattle | | 11.35 | 12.45 | 13.40 | 12.80 | 10.95 | 11.50 | 10.80 | 16.20 | 18.60 | 17.85 | 22.70 | 22.15 |
| Spokane | .15 | 11.35 | 12.45 | 13.40 | 12.80 | 10.95 | 11.50 | 10.80 | 16.35 | 17.75 | 17.95 | 21.58 | 22.30 |
| St. Louis** | .15 | 9.57 | 10.75 | 11.23 | 11.74 | 9.43 | 9.95 | 9.59 | 11.43 | 17.48 | 16.48 | 21.58 | 20.83 |
| St. Paul | .15 | 9.72 | 10.39 | 11.54 | 11.89 | 9.56 | 10.07 | 9.72 | 11.64 | ..... | 16.69 | ..... | 21.04 |

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 4999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may be combined with each other for quantity. **These cities are on order quantity pricing. Prices shown are for 2000 lb item quantities of the following: Hot-rolled sheet—10 ga. x 36 x 96—120; Cold-rolled sheet—20 ga x 36 x 96—120; Galv. sheet—10 ga x 36—120; Hot-rolled strip—¼" x 1"; Plate—¼" x 84"; Shapes—I-Beams 6 x 12.5; Hot-rolled bar—Rounds—¾-2 15/16; Cold-finished bar—C 1018—1" rounds; Alloy bar—hot-rolled 4615—1⅝" to 2⅞"; cold drawn—15/16" to 2⅞" round; Hot-rolled 4140—⅝" to 2⅞" round, cold drawn—15/16" to 2⅞" round.

†† 13¢ zinc. ‡ Deduct for country delivery. [1] 15 ga. & heavier; [2] 14 ga. & lighter. [3] 10 ga. x 48 — 120.

(Effective Apr. 24, 1961)

## PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

| Producing Point | Basic | Fdry. | Mall. | Bess. | Low Phos. |
|---|---|---|---|---|---|
| Birdsboro, Pa. *B6* | 68.00 | 68.50 | 69.00 | 69.50 | 73.00 |
| Birmingham *R3* | 62.00 | 62.50* | 66.50 | ..... | ..... |
| Birmingham *W9* | 62.00 | 62.50* | 66.50 | ..... | ..... |
| Birmingham *U4* | 62.00 | 62.50* | 66.50 | ..... | ..... |
| Buffalo *R3* | 66.00 | 66.50 | 67.00 | 67.50 | ..... |
| Buffalo *H1* | 66.00 | 66.50 | 67.00 | 67.50 | 71.50† |
| Buffalo *W6* | 66.00 | 66.50 | 67.00 | 67.50 | ..... |
| Chester *P2* | 66.00 | 68.50 | 69.00 | ..... | ..... |
| Chicago *I4* | 66.00 | 66.50 | 66.50 | 67.00 | ..... |
| Cleveland *A5* | 66.00 | 66.50 | 66.50 | 67.00 | 71.00† |
| Cleveland *R3* | 66.00 | 66.50 | 66.50 | 67.00 | ..... |
| Duluth *I4* | 66.00 | 66.50 | 66.50 | 67.00 | 71.00† |
| Erie *I4* | 66.00 | 66.50 | 66.50 | 67.00 | 71.00† |
| Fontana *K1* | 75.00 | 75.50 | ..... | ..... | ..... |
| Geneva, Utah *C7* | 66.00 | 66.50 | ..... | ..... | ..... |
| Granite City *G2* | 67.90 | 68.40 | 68.90 | ..... | ..... |
| Hubbard *Y1* | ..... | ..... | 66.50 | ..... | ..... |
| Ironton, Utah *C7* | 66.00 | 66.50 | ..... | ..... | ..... |
| Lyles, Tenn. *T3* | ..... | ..... | ..... | ..... | 73.00 |
| Midland *C11* | 66.00 | ..... | ..... | ..... | ..... |
| Minnequa *C6* | 68.00 | 68.50 | 69.00 | ..... | ..... |
| Monessen *P6* | 66.00 | ..... | ..... | ..... | ..... |
| Neville Is. *P4* | 66.00 | 66.50 | 66.50 | 67.00 | 71.00† |
| N. Tonawanda *T1* | ..... | 66.50 | 67.00 | 67.50 | ..... |
| Rockwood *T3* | 62.00 | 62.50 | 66.50 | 67.00 | 73.00 |
| Sharpsville *S3* | 66.00 | ..... | 66.50 | 67.00 | ..... |
| So. Chicago *R3* | 66.00 | 66.50 | 66.50 | 67.00 | ..... |
| So. Chicago *W8* | 66.00 | ..... | 66.50 | 67.00 | ..... |
| Swedeland *A2* | 68.00 | 68.50 | 69.00 | 69.50 | 71.00† |
| Toledo *I4* | 66.00 | 66.50 | 66.50 | 67.00 | ..... |
| Troy, N. Y. *R3* | 68.00 | 68.50 | 69.00 | 69.50 | 73.00 |
| Youngstown *Y1* | ..... | ..... | 66.50 | ..... | ..... |

**DIFFERENTIALS:** Add, 75¢ per ton for each 0.25 pct silicon or portion thereof over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct) 50¢ per ton for each 0.25 pct manganese or portion thereof over 1 pct, $2 per ton for 0.50 to 0.75 pct nickel, $1 for each additional 0.25 pct nickel.

Add $1.00 for 0.31-0.69 pct phos. Add 50¢ per gross ton for truck loading charge.

Silvery Iron: Buffalo (6 pct), *H1*, $79.25; Jackson *J1, I4*, Toledo, *I4*, $78.00; Niagara Falls (15.01-15.50), $101.00; Keokuk (14.01-14.50), $89.00; (15.51-16.00), $92.00. Add 75¢ per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 13 pct; 13 to 13.5 pct; 13.5 to 14 pct, add $1. Add $1.00 for each 0.50 pct manganese over 1.00 pct.

† Intermediate low phos.

## FASTENERS

*(Base discounts, f.o.b. mill, based on latest list prices)*

### Hex Screws and All Bolts Including Hex & Hex, Square Machine, Carriage, Lag, Plow, Step, and Elevator

*(Discount for 1 container)*

| | Pct |
|---|---|
| Plain finish—packaged and bulk | 46 |
| Hot galvanized and zinc plated—packaged | 39.25 |
| Hot galvanized and zinc plated—bulk | 46 |

### Nuts: Hexagon and Square, Hex, Heavy Hex, Thick Hex & Square

*(Discount for 1 container)*

| | Pct |
|---|---|
| Plain finish—packaged and bulk | 46 |
| Hot galvanized and zinc plated—packaged | 39.25 |
| Hot galvanized and zinc plated—bulk | 46 |

### Hexagon Head Cap Screws—UNC or UNF Thread—Bright & High Carbon

*(Discount for 1 container)*

| | Pct |
|---|---|
| Plain finish—packaged and bulk | 46 |
| Hot galvanized and zinc plated—packaged | 39.25 |
| Hot galvanized and zinc plated—bulk | 46 |

*(On all the above categories add 25 pct for less than container quantities. Minimum plating charge—$10.00 per item. Price on application assembled to bolts.)*

### Machine Screws and Stove Bolts

*(Packages—plain finish)*

| | Discount Screws | Bolts |
|---|---|---|
| Full Cartons | 46 | 46 |
| **Machine Screws—bulk** | | |
| ¼ in. diam or smaller | 25,000 pcs | 50 |
| 5/16, ⅜ & ½ in. diam | 15,000 pcs | 50 |

### Machine Screw and Stove Bolt Nuts

*(Packages—plain finish)*

| | Discount Hex | Square |
|---|---|---|
| Full Cartons | 46 | 57 |
| Bulk | | |
| ¼ in. diam or smaller | 25,000 pcs | |
| 5/16 or ⅜ in. diam | 56 | 60 |
| | 15,000 pcs | |
| | 56 | 60 |

### Rivets

| | *Base per* 100 *lb* |
|---|---|
| ½ in. diam and larger | $12.85 |
| | *Pct Off List* |
| 7/16 in. and smaller | 15 |

## TOOL STEEL

*F.o.b. mill*

| W | Cr | V | Mo | Co | per lb | SAE |
|---|---|---|---|---|---|---|
| 18 | 4 | 1 | — | — | $1.84 | T-1 |
| 18 | 4 | 1 | — | 5 | 2.545 | T-4 |
| 18 | 4 | 2 | — | — | 2.005 | T-2 |
| 1.5 | 4 | 1.5 | 8 | — | 1.20 | M-1 |
| 6 | 4 | 3 | 6 | — | 1.59 | M-3 |
| 6 | 4 | 2 | 5 | — | 1.345 | M-2 |
| High-carbon chromium | | | | | .955 | D-3, D-5 |
| Oil hardened manganese | | | | | .505 | O-2 |
| Special carbon | | | | | .38 | W-1 |
| Extra carbon | | | | | .38 | W-1 |
| Regular carbon | | | | | .325 | W-1 |

Warehouse prices on and east of Mississippi are 4¢ per lb higher. West of Mississippi, 6¢ higher.

## LAKE SUPERIOR ORES

*51.50% Fe natural, delivered lower Lake ports. Interim prices for 1960 season. Freight changes for seller's account.*

| | *Gross Ton* |
|---|---|
| Openhearth lump | $12.70 |
| Old range, bessemer | 11.85 |
| Old range, nonbessemer | 11.70 |
| Mesabi, bessemer | 11.60 |
| Mesabi, nonbessemer | 11.45 |
| High phosphorus | 11.45 |

## STAINLESS STEEL

Base price cents per lb. f.o.b. mill

| Product | 201 | 202 | 301 | 302 | 303 | 304 | 316 | 321 | 347 | 403 | 410 | 416 | 430 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ingots, reroll. | 22.75 | 24.75 | 24.00 | 26.25 | — | 28.00 | 41.25 | 33.50 | 38.50 | — | 17.50 | — | 17.75 |
| Slabs, billets | 25.00 | 28.25 | 26.00 | 29.50 | 32.00 | 29.50 | 47.50 | 38.00 | 46.50 | — | 19.25–21.50 | — | 19.75–21.75 |
| Billets, forging | — | 37.75 | 38.75 | 39.50 | 42.50 | 39.50 | 64.50 | 48.75 | 57.75 | 29.25 | 29.25–26.75 | 29.75 | 29.75 |
| Bars, struct. | 43.50 | 44.50 | 46.00 | 46.75 | 49.75 | 46.75 | 75.75 | 57.50 | 67.25 | 35.00 | 35.00–31.50 | 35.50 | 35.50 |
| Plates | 39.25 | 40.00 | 41.25 | 42.25 | 45.00 | 45.75 | 71.75 | 54.75 | 64.75 | 30.00 | 30.00 | 31.25–31.75 | 31.00 |
| Sheets | 48.50 | 49.25 | 51.25 | 52.00 | 56.75 | 52.00 | 80.75 | 65.50 | 79.25 | 40.25 | 40.25 | 48.25 | 40.75 |
| Strip, hot-rolled | 36.00 | 39.00 | 37.25 | 40.50 | — | 40.50 | 68.50 | 53.50 | 63.50 | — | 31.00 | — | 32.00 |
| Strip, cold-rolled | 45.00 | 49.25 | 47.50 | 52.00 | 56.75 | 52.00 | 80.75 | 65.50 | 79.25 | 40.25 | 40.25 | 42.50 | 40.75 |
| Wire CF; Rod HR | — | 42.25 | 43.50 | 44.25 | 47.25 | 44.25 | 71.75 | 54.50 | 63.75 | 33.25 | 33.25–29.75 | 33.75 | 33.75 |

STAINLESS STEEL PRODUCING POINTS:

*Sheets:* Midland, Pa., *C11;* Brackenridge, Pa., *A3;* Butler, Pa., *A7;* Vandergrift, Pa., *U1;* Washington, Pa., *W2, J2;* Baltimore, *E1;* Middletown, O., *A7;* Massillon, O., *R3;* Gary, *U1;* Bridgeville, Pa., *U2;* New Castle, Ind., *I2;* Detroit, *M2;* Louisville, O., *R5.*

*Strip:* Midland, Pa., *C11;* Waukegan, Cleveland, *A5;* Carnegie, Pa., *S9;* McKeesport, Pa., *F1;* Reading, Pa., *C2;* Washington, Pa., *W2;* W. Leechburg, Pa., *A3;* Bridgeville Pa., *U2;* Detroit, *M2;* Detroit, *S1;* Canton, Massillon, O., *R3;* Harrison, N. J., *D3;* Youngstown, *R5;* Sharon, Pa., *S1;* Butler, Pa., *A7;* Wallingford, Conn., *U3* (plus further conversion extras); *W1* (25¢ per lb. higher); Seymour, Conn., *S13,* (25¢ per lb. higher); New Bedford, Mass., *R6* Gary, *U1,* (25¢ per lb. higher); Baltimore, Md., *E1* (300 series only).

*Bar:* Baltimore, *A7;* S. Duquesne, Pa., *U1;* Munhall, Pa., *U1;* Reading, Pa., *C2;* Titusville, Pa., *U2;* Washington, Pa., *J2;* McKeesport, Pa., *U1, F1;* Bridgeville, Pa., *U2;* Dunkirk, N. Y., *A3;* Massillon, O., *R3;* S. Chicago, *U1;* Syracuse, N. Y., *C11;* Watervliet, N. Y., *A3;* Waukegan, *A5;* Canton, O., *T5, R3;* Ft. Wayne, *I4;* Detroit, *R5;* Gary, *U1;* Owensboro, Ky., *G5;* Bridgeport, Conn., *N8;* Ambridge, Pa., *B7.*

*Wire:* Waukegan, *A5;* Massillon, O., *R3;* McKeesport, Pa., *F1;* Ft. Wayne, *I4;* Newark, N. J. *D2;* Harrison, N. J., *D3;* Baltimore, *A7;* Dunkirk, *A3;* Monessen, *P1;* Syracuse, *C11;* Bridgeville, *U2;* Detroit, *R5;* Reading, Pa., *C2;* Bridgeport, Conn., *N8* (down to and including ¼").

*Structurals:* Baltimore, *A7;* Massillon, O., *R3;* Chicago, Ill., *J4;* Watervliet, N. Y., *A3;* Syracuse, *C11;* S. Chicago, *U1.*

*Plates:* Ambridge, Pa., *B7;* Baltimore, *E1;* Brackenridge, Pa., *A3,* Chicago, *U1;* Munhall, Pa., *U1;* Midland, Pa., *C11;* New Castle, Ind., *I2;* Middletown, *A7,* Washington, Pa., *J2;* Cleveland, Massillon, *R3;* Coatesville, Pa., *C15;* Vandergrift, Pa., *U1;* Gary, *U1.*

*Forging billets:* Ambridge Pa., *B7;* Midland, Pa., *C11;* Baltimore, *A7;* Washington, Pa., *J2;* McKeesport, *F1;* Massillon, Canton, O., *R3;* Watervliet, *A3;* Pittsburgh, Chicago, *U1;* Syracuse, *C11;* Detroit, *R5;* Munhall, Pa., S. Chicago, *U1;* Owensboro, Ky., *G5;* Bridgeport, Conn., *N8;* Reading, Pa., *C2.*

## MERCHANT WIRE PRODUCTS

| | Standard & Coated Nails | Woven Wire Fence | "T" Fence Posts | Single Loop Bale Ties | Galv. Barbed and Twisted Barbless Wire | Merch. Wire Ann'ld | Merch. Wire Galv. |
|---|---|---|---|---|---|---|---|
| F.o.b. Mill | Col | Col | Col | Col | Col | ¢/lb. | ¢/lb. |
| Alabama City *R3* | 173 | 187 | ... | 212 | 193 | 9.00 | 9.55 |
| Aliquippa *J3*** | 173 | 190 | ... | ... | 190 | 9.00 | 9.675 |
| Atlanta *A8*** | 173 | 191 | ... | 212 | 197 | 9.00 | 9.75 |
| Bartonville *K2*** | 175 | 193 | 183 | 214 | 199 | 9.10 | 9.85 |
| Buffalo *W6* | ..... | ..... | ..... | ..... | ..... | 9.00 | 9.55* |
| Chicago *N4* | 173 | 191 | 177 | 212 | 197 | 9.00 | 9.75 |
| Chicago *R3* | ..... | ..... | ..... | ..... | ..... | 9.00 | 9.55 |
| Chicago *W7* | 173 | ..... | ..... | ..... | ..... | 9.00 | 9.55† |
| Cleveland *A6* | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Cleveland *A5* | ..... | ..... | ..... | ..... | ..... | 9.00 | ..... |
| Crawf'dav. *M4*** | 175 | 192 | ... | 214 | 198 | 9.10 | 9.80 |
| Donora Pa. *A5* | 173 | 187 | ... | 212 | 193 | 9.00 | 9.55 |
| Duluth *A5* | 173 | 187 | 177 | 212 | 193 | 9.00 | 9.55 |
| Fairfield, Ala. *T2* | 173 | 187 | ... | 212 | 193 | 9.00 | 9.55 |
| Galveston *D4* | 9.10‡ | ..... | ..... | ..... | ..... | ..... | ..... |
| Houston *S2* | 178 | 192 | ... | 217 | 198 | 9.25 | 9.80† |
| Jacksonville *M4* | 175 | 192 | ... | 214 | 198 | 9.10 | 9.80†† |
| Johnstown *B3*** | 173 | 190 | 177 | ... | 196 | 9.00 | 9.675 |
| Joliet Ill. *A5* | 173 | 187 | ... | 212 | 193 | 9.00 | 9.55 |
| Kokomo *C9** | 175 | 189 | ... | 214 | 195* | 9.10 | 9.65* |
| L. Angeles *B2**** | ..... | ..... | ..... | ..... | ..... | 9.95 | 10.625 |
| Kansas City *S2** | 178 | 192 | ... | 217 | 198* | 9.25 | 9.80† |
| Minnequa *C6* | 178 | 192 | 182 | 217 | 198† | 9.25 | 9.80† |
| Palmer, Mass *W6* | ..... | ..... | ..... | ..... | ..... | 9.30 | 9.85* |
| Pittsburg, Cal. *C7* | 192 | 210 | ..... | ... | 213 | 9.95 | 10.50 |
| Rankin Pa. *A5* | 173 | 187 | ..... | ... | 193 | 9.00 | 9.55 |
| So. Chicago *R3* | 173 | 187 | ..... | ... | 193 | 8.65 | 9.20 |
| S. San Fran. *C6* | ..... | ..... | ..... | 236 | ..... | 9.95 | 10.50 |
| SparrowsPt. *B3*** | 175 | ..... | ... | 215 | 198 | 9.10 | 9.775 |
| Struthers, O. *Y1** | ..... | ..... | ..... | ..... | ..... | 8.65 | 9.20 |
| Worcester *A5* | 179 | ..... | ..... | ..... | ..... | 9.30 | 9.85‡ |
| Williamsport *S5* | ..... | ..... | ..... | ..... | ..... | ..... | ..... |

* Zinc less than .10¢. *** .10¢ zinc.
** 13-13.5¢ zinc. † Plus zinc extras.
‡ Wholesalers only. †† 0.115¢ zinc.

(Effective Apr. 24, 1961)

## PIPE AND TUBING

Base discounts (pct) f.o.b. mills. Base price about $290 per net ton.

| STANDARD T. & C. | BUTTWELD | | | | | | | | | | | | | | SEAMLESS | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ½ In. | | ¾ In. | | 1 In. | | 1¼ In. | | 1½ In. | | 2 In. | | 2½–3 In. | | 2 In. | | 2½ In. | | 3 In. | | 3½–4 In. | |
| | Blk. | Gal. | Blk. | Gal. | Blk. | Gal. | Blk. | Gal. | Blk. | Gal. | Blk. | Gal. | Blk. | Gal. | Blk. | Gal. | Blk. | Gal. | Blk. | Gal. | Blk. | Gal. |
| Sparrows Pt. *B3* | 0.25 | *15.0 | 3.25 | *11.0 | 6.75 | *6.50 | 9.25 | *5.75 | 9.75 | *4.75 | 10.25 | *4.25 | 11.75 | *4.50 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Youngstown *R3* | 2.25 | *13.0 | 5.25 | *9.0 | 8.75 | *4.50 | 11.25 | *3.75 | 11.75 | *2.75 | 12.25 | *2.25 | 13.75 | *2.50 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Fontana *K1* | *10.75 | *26.00 | *7.75 | *22.00 | *4.25 | *17.50 | *1.75 | *16.75 | *1.25 | *15.75 | *0.75 | *15.25 | 0.75 | *15.50 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Pittsburgh *J3* | 2.25 | *13.0 | 5.25 | *9.0 | 8.75 | *4.50 | 11.25 | *3.75 | 11.75 | *2.75 | 12.25 | *2.25 | 13.75 | *2.50 | *12.25 | *27.25 | *5.75 | *22.50 | *3.25 | *20.0 | *1.75 | *18.50 |
| Alton, Ill. *L1* | 0.25 | *15.0 | 3.25 | *11.0 | 6.75 | *6.50 | 9.25 | *5.75 | 9.75 | *4.75 | 10.25 | *4.25 | 11.75 | *4.50 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Sharon *M3* | 2.25 | *13.0 | 5.25 | *9.0 | 8.75 | *4.50 | 11.25 | *3.75 | 11.75 | *2.75 | 12.25 | *2.25 | 13.75 | *2.50 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Fairless *N2* | 0.25 | *15.0 | 3.25 | *11.0 | 6.75 | *6.50 | 9.25 | *5.75 | 9.75 | *4.75 | 10.25 | *4.25 | 11.75 | *4.50 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Pittsburgh *N1* | 2.25 | *13.0 | 5.25 | *9.0 | 8.75 | *4.50 | 11.25 | *3.75 | 11.75 | *2.75 | 12.25 | *2.25 | 13.75 | *2.50 | *12.25 | *27.25 | *5.75 | *22.50 | *3.25 | *20.0 | *1.75 | *18.50 |
| Wheeling *W5* | 2.25 | *13.0 | 5.25 | *9.0 | 8.75 | *4.50 | 11.25 | *3.75 | 11.75 | *2.75 | 12.25 | *2.25 | 13.75 | *2.50 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Wheatland *W4* | 2.25 | *13.0 | 5.25 | *9.0 | 8.75 | *4.50 | 11.25 | *3.75 | 11.75 | *2.75 | 12.25 | *2.25 | 13.75 | *2.50 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Youngstown *Y1* | 2.25 | *13.0 | 5.25 | *9.0 | 8.75 | *4.50 | 11.25 | *3.75 | 11.75 | *2.75 | 12.25 | *2.25 | 13.75 | *2.50 | *12.25 | *27.25 | *5.75 | *22.50 | *3.25 | *20.0 | *1.75 | *18.50 |
| Indiana Harbor *Y1* | 1.25 | *14.0 | 4.25 | *10.0 | 7.75 | *5.50 | 10.25 | *4.75 | 10.75 | *3.75 | 11.25 | *3.25 | 12.75 | *3.50 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Lorain *N2* | 2.25 | *13.0 | 5.25 | *9.0 | 8.75 | *4.50 | 11.25 | *3.75 | 11.75 | *2.75 | 12.25 | *2.25 | 13.75 | *2.50 | *12.25 | *27.25 | *5.75 | *22.50 | *3.25 | *20.0 | *1.75 | *18.50 |
| EXTRA STRONG PLAIN ENDS | | | | | | | | | | | | | | | | | | | | | | |
| Sparrows Pt. *B3* | 4.75 | *9.0 | 8.75 | *5.0 | 11.75 | *0.50 | 12.25 | *1.75 | 12.75 | *0.75 | 13.25 | *0.25 | 13.75 | *1.50 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Youngstown *R3* | 6.75 | *7.0 | 10.75 | *3.0 | 13.75 | 1.50 | 14.25 | 0.25 | 14.75 | 1.25 | 15.25 | 1.75 | 15.75 | 0.50 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Fairless *N2* | 4.75 | *9.0 | 8.75 | *5.0 | 11.75 | *0.50 | 12.25 | *1.75 | 12.75 | *0.75 | 13.25 | *0.25 | 13.75 | *1.50 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Fontana *K1* | *6.25 | ..... | *2.25 | ..... | 0.75 | ..... | 1.25 | ..... | 1.75 | ..... | 2.25 | ..... | 2.75 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Pittsburgh *J3* | 6.75 | *7.0 | 10.75 | *3.0 | 13.75 | 1.50 | 14.25 | 0.25 | 14.75 | 1.25 | 15.25 | 1.75 | 15.75 | 0.50 | *10.75 | *24.75 | *3.25 | *19.0 | *0.75 | *16.50 | 4.25 | *11.50 |
| Alton, Ill. *L1* | 4.75 | *9.0 | 8.75 | *5.0 | 11.75 | *0.50 | 12.25 | *1.75 | 12.75 | *0.75 | 13.25 | *0.25 | 13.75 | *1.50 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Sharon *M3* | 6.75 | *7.0 | 10.75 | *3.0 | 13.75 | 1.50 | 14.25 | 0.25 | 14.75 | 1.25 | 15.25 | 1.75 | 15.75 | 0.50 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Pittsburgh *N1* | 6.75 | *7.0 | 10.75 | *3.0 | 13.75 | 1.50 | 14.25 | 0.25 | 14.75 | 1.25 | 15.25 | 1.75 | 15.75 | 0.50 | *10.75 | *24.75 | *3.25 | *19.0 | *0.75 | *16.50 | 4.25 | *11.50 |
| Wheeling *W5* | 6.75 | *7.0 | 10.75 | *3.0 | 13.75 | 1.50 | 14.25 | 0.25 | 14.75 | 1.25 | 15.25 | 1.75 | 15.75 | 0.50 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Wheatland *W4* | 6.75 | *7.0 | 10.75 | *3.0 | 13.75 | 1.50 | 14.25 | 0.25 | 14.75 | 1.25 | 15.25 | 1.75 | 15.75 | 0.50 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Youngstown *Y1* | 6.75 | *7.0 | 10.75 | *3.0 | 13.75 | 1.50 | 14.25 | 0.25 | 14.75 | 1.25 | 15.25 | 1.75 | 15.75 | 0.50 | *10.75 | *24.75 | *3.25 | *19.0 | *0.75 | *16.50 | 4.25 | *11.50 |
| Indiana Harbor *Y1* | 5.75 | *8.0 | 9.75 | *4.0 | 12.75 | 0.50 | 13.25 | *0.75 | 13.75 | 0.25 | 14.25 | 0.75 | 14.75 | *0.50 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Lorain *N2* | 6.75 | *7.0 | 10.75 | *3.0 | 13.75 | 1.50 | 14.25 | 0.25 | 14.75 | 1.25 | 15.25 | 1.75 | 15.75 | 0.50 | *10.75 | *24.75 | *3.25 | *19.0 | *0.75 | *16.50 | 4.25 | *11.50 |

Threads only, buttweld and seamless, 2¼ pt. higher discount. Plain ends, buttweld and seamless, 3-in. and under, 5½ pt. higher discount.

Galvanized discounts based on zinc price range of over 9¢ to 11¢ per lb. East St. Louis. For each 2¢ change in zinc, discounts vary as follows: ½, ¾ and 1-in., 2 pt.; 1¼, 1½ and 2-in., 1½ pt.; 2½ and 3-in., 1 pt., e.g., zinc price range of over 13¢ to 15¢ would lower discounts on 2½ and 3-in. pipe by 2 points; zinc price in range over 7¢ to 9¢ would increase discounts. East St. Louis zinc price now 11.50¢ per lb.

## CAST IRON WATER PIPE INDEX

| | |
|---|---|
| Birmingham | 125.8 |
| New York | 138.6 |
| Chicago | 140.0 |
| San Francisco-L. A. | 148.6 |

*Dec. 1955, value, Class B or heavier 5 in. or larger, bell and spigot pipe. Explanation: p. 57, Sept. 1, 1955, issue. Source: U. S. Pipe and Foundry Co.*

## COKE

| Furnace, beehive (f.o.b.) | Net-Ton |
|---|---|
| Connellsville, Pa. | $14.75 to $15.50 |
| Foundry, beehive (f.o.b.) | $18.50 |
| Foundry oven coke | |
| Buffalo, del'd | $33.25 |
| Chattanooga, Tenn. | 30.80 |
| Ironton, O., f.o.b. | 30.50 |
| Detroit, f.o.b. | 32.00 |
| New England, del'd | 33.55 |
| New Haven, f.o.b. | 31.00 |
| Kearny, N. J., f.o.b. | 31.25 |
| Philadelphia, f.o.b. | 31.00 |
| Swedeland, Pa., f.o.b. | 31.00 |
| Painesville, Ohio, f.o.b. | 32.00 |
| Erie, Pa., f.o.b. | 32.00 |
| St. Paul, f.o.b. | 31.25 |
| St Louis, f.o.b. | 33.00 |
| Birmingham, f.o.b. | 30.35 |
| Milwaukee, f.o.b. | 32.00 |
| Neville Is., Pa. | 30.75 |


*Lightweight • Compact • Rugged!*

CURTISS WRIGHT

FEDREX

PORTABLE X-RAY UNITS

Small, portable, high-powered FEDREX units are the most flexible and useful X-Ray equipment ever offered. Their high ma output, long duty cycle and rugged construction are unequalled. Available in 140, 160, 200 and 260 KV units. (160 and 200 KV 360° models also available.) Stepless independent KV and milliampere adjustments over wide ranges permit exact exposure setting without guesswork. Built-in synchronous timer and exposure charts simplify setups and assure accurate results.

Shielding in the X-Ray head reduces stray radiation from all models to 5mr/hr or less at 10 feet. Automatic shut-off controls provide complete overload and flashover protection.

Write for additional information or phone SWinburne 9-0500

CURTISS WRIGHT

Princeton Division CORPORATION Princeton, New Jersey

In CANADA: Canadian Curtiss-Wright Ltd., 43 Westminster Ave., N., Montreal 28, P.Q., Can.



stack-molding gives you lower-cost castings

This 2¼-pound gray iron casting is a generator part for an automotive electrical system.

COSTS were CUT by casting 60 at a time . . . 5 to a mold . . . 12 molds high.

If you have high-volume requirements for fairly flat parts . . . investigate STACK-MOLDING.

to fill your IMMEDIATE NEEDS for QUALITY PRECISION CASTINGS at LOWER COST

*Contact . . .*

**RELIABILITY** . . . Uniformly high quality, with dependable composition and structure.

**ACCURACY** . . . Maintenance of close tolerances reduces production costs.

**HIGH STRENGTH** . . . Heat-treating facilities available to provide any desired properties.

OVERNIGHT DELIVERY WITHIN 500 MILES

GL GREAT LAKES FOUNDERS & MACHINE CORP. LUDINGTON, MICH.

Specialists in Stack-, $CO_2$, and Shell-Mold Casting

# FERROALLOY PRICES

### Ferrochrome

Cents per lb contained Cr, lump, bulk, carloads, del'd. 65-71% Cr, .30-1.00% max. Si.

| | | | |
|---|---|---|---|
| 0.02% C | 41.00 | 0.50% C | 33.25 |
| 0.05% C | 34.00 | 1.00% C | 33.00 |
| 0.10% C | 33.75 | 1.50% C | 32.75 |
| 0.20% C | 33.50 | 2.00% C | 32.50 |

3-5% C, 53-63% Cr, 2.5% max. Si ... 26.00
4-6% C, 58-63% Cr, 3-6% Si ... 22.50
5-8% C, 58-63% Cr, 3-6% Si ... 22.50
6-8% C, 50-56% Cr, 4-7% Si ... 22.00
4.00-4.50% C, 60-70% Cr, 1.2% Si .. 28.75
0.025% C (Simplex) ... 31.50
0.010% C max, 63-66% Cr, 5-7% Si. 32.50
0.010% C max, 68-71% Cr, 2% Si max ... 31.50
0.25% C max ... 33.50

### High Nitrogen Ferrochrome

Low-carbon type 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome max. 0.10% C price schedule.

### Chromium Metal

Per lb chromium, contained, packed delivered, ton lots, 97.25% min. Cr, 1% max. Fe.
0.10% max. C ... $1.29
9 to 11% C, 88-91% Cr, 0.75% Fe ... 1.38

### Electrolytic Chromium Metal

Per lb of metal 2" x D plate (⅛" thick) delivered packed, 99.80% min. Cr. (Metallic Base) Fe 0.20 max.
Carloads ... $1.15
Ton lots ... 1.17
Less ton lots ... 1.19

### Low Carbon Ferrochrome Silicon

(Cr 39-41%, Si 42-45%, C 0.05% max.)
Carloads, delivered, lump, 3-in x down, packed.
Price is sum of contained Cr and contained Si.

| | Cr | Si |
|---|---|---|
| Carloads, bulk | 22.50 | 14.60 |
| Ton lots | 30.45 | 16.05 |
| Less ton lots | 33.40 | 17.70 |

### Calcium-Silicon

Per lb of alloy, lump, delivered, packed. 30-33% Cr, 60-65% Si, 3.00 max. Fe.
Carloads, bulk ... 24.00
Ton lots ... 27.95
Less ton lots ... 29.45

### Calcium-Maganese—Silicon

Cents per lb of alloy, lump, delivered, packed.
16-20% Ca, 14-18% Mn, 53-59% Si.
Carloads, bulk ... 23.00
Ton lots ... 26.15
Less ton lots ... 27.15

### SMZ

Cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe ½ in. x 12 mesh.
Ton lots ... 21.15
Less ton lots ... 22.40

### V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed max. St. Louis, V-5: 38-42% Cr, 17-19% Si, 8-11% Mn, packed.
Carload lots ... 18.45
Ton lots ... 19.95
Less ton lots ... 21.20

### Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.
Carload bulk ... 19.20
Ton lots to carload packed ... 21.15
Less ton lots ... 22.40

### Ferromanganese

Maximum base price, f.o.b., lump size, base content 74 to 76 pct Mn. Carload lots, bulk.

| Producing Point | Cents per-lb |
|---|---|
| Marietta, Ashtabula, O.; Alloy, W. Va.; Sheffield, Ala.; Portland, Ore. | 11.00 |
| Houston, Tex. | 11.00 |
| Johnstown, Pa. | 11.00 |
| Lynchburg, Va. | 11.00 |
| Neville Island, Pa. | 11.00 |
| Sheridan, Pa. | 11.00 |
| Philo, Ohio | 11.00 |
| Rockwood, Tenn. | 11.00 |
| S. Duquesne | 11.00 |

Add or substract 0.1¢ for each 1 pct Mn above or below base content.
Briquets, delivered, 66 pct Mn:
Carloads, bulk ... 13.70
Ton lots packed in bags ... 16.10

### Spiegeleisen

Per gross ton, lump, f.o.b., 3% Si max.

| Mn | Palmerton, Pa. 10 lb, pig | 35 lb, down | Neville Is., Pa. 35 lb |
|---|---|---|---|
| 16-19% | $98.00 | $96.00 | $100.50 |
| 19-21% | 100.00 | 98.00 | 102.50 |
| 21-23% | 102.50 | 100.00 | 105.50 |

### Manganese Metal

2 in. x down, cents per pound of metal delivered.
95.50% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.
Carload, packed ... 45.75
Ton lots ... 47.25

### Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, f.o.b. Marietta, O., delivered, cents per pound.
Carloads, bulk ... 34.25
Ton lots, palletized ... 36.25
250 to 1999 lb ... 39.00
Premium for Hydrogen - removed metal ... 0.75

### Medium Carbon Ferromanganese

Mn 80 to 85%, C 1.25 to 1.50, Si 1.50% max., carloads, lump, bulk, delivered, per lb of contained Mn ... 24.00

### Low-Carb Ferromanganese

Cents per pound Mn contained, lump size, packed, del'd Mn 85-90%.

| | Carloads | Ton | Less |
|---|---|---|---|
| 0.07% max. C, 0.06% (Bulk) P, 90% Mn | 37.15 | 39.95 | 41.15 |
| 0.07% max. C | 35.10 | 37.90 | 39.10 |
| 0.10% max. C | 34.35 | 37.15 | 38.35 |
| 0.15% max. C | 31.10 | 33.90 | 35.10 |
| 0.30% max. C | 29.80 | 32.60 | 33.80 |
| 0.50% max. C | 28.50 | 31.30 | 32.50 |
| 0.75% max. C, 80.85% Mn, 5.0-7.0% Si | 27.00 | 29.80 | 31.00 |

### Silicomanganese

Lump size, cents per pound of metal, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.3¢ f.o.b. shipping point.
Carloads bulk ... 11.60
Ton lots, packed ... 13.25
Carloads, bulk, delivered, per lb of briquet ... 14.00
Briquets, packed pallets, 2000 lb up to carloads ... 16.40

### Silvery Iron (electric furnace)

Si 15.50 to 16.00 pct., f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $106.50 gross ton, frieght allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $93.00.

### Silicon Metal

Cents per pound contained Si, lump size, delivered, packed.

| | Ton lots, | Carloads, |
|---|---|---|
| 98.25% Si, 0.50% Fe | 22.95 | 21.65 |
| 98% Si, 1.0% Fe | 21.95 | 20.65 |

### Silicon Briquets

Cents per pound of briquets, bulk, delivered, 40% Si, 2 lb Si, briquets.
Carloads, bulk ... 8.00
Ton lots, packed ... 10.80

### Electric Ferrosilicon

Cents per lb contained Si, lump, bulk, carloads, f.o.b. shipping point.

| | | | |
|---|---|---|---|
| 50% Si | 14.60 | 75% Si | 16.90 |
| 65% Si | 15.75 | 85% Si | 18.60 |
| | 90% Si | 20.00 | |

### Ferrovanadium

50-55% V delivered, per pound, contained V, in any quantity.
Openhearth ... 3.20
Crucible ... 3.30
High speed steel ... 3.40

### Calcium Metal

Eastern zone, cents per pound of metal, delivered.

| | Cast | Turnings | Distilled |
|---|---|---|---|
| Ton lots | $2.05 | $2.95 | $3.75 |
| 100 to 1999 lb | 2.40 | 3.30 | 4.55 |

(Effective Apr. 24, 1961)

**Alsifer,** 20% Al, 40% Si, 40% Fe, f.o.b. Suspension Bridge, N. Y. per lb.
Carloads, bulk ... 9.85¢
Ton lots ... 11.20¢

**Calcium molybdate,** 43.6-46.6% f.o.b. Langeloth, Pa., per pound contained Mo ... $1.50

**Ferrocolumbium,** 58-62% Cb, 2 in. x D, del'd per lb con't Cb
Ton lots ... $3.45
Less ton lots ... 3.50

**Ferro-tantalum-columbium,** 20% Ta, 40% Cb, 0.30% C, del'd ton lots, 2-in. x D per lb con't Cb plus Ta ... $3.40

**Ferromolybdenum,** 55-75%, 200-lb containers, f.o.b. Langeloth, Pa., per pound contained Mo .. $1.76

**Ferrophosphorus,** electric, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., $5.00 unitage, per gross ton ... $120.00
10 tons to less carload ... $131.00

**Ferrotitanium,** 40% regular grade 0.10% C max., f.o.b. Niagara Falls, N. Y., and Cambridge, O., freight allowed, ton lots, per lb contained Ti ... $1.35

**Ferrotitanium,** 25% low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Cambridge, O., freight allowed, ton lots, per lb contained Ti ... $1.50
Less ton lots ... $1.54

**Ferrotitanium,** 15 to 18% high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload per net ton ... $255.00

**Ferrotungsten,** ¼ x down packed per pounds contained W, ton lots delivered ... $2.15 (nominal)

**Molybdic oxide,** briquets per lb. contained Mo, f.o.b. Langeloth, Pa. ... $1.49
bags, f.o.b. Washington, Pa., Langeloth, Pa. ... $1.38

**Simanal,** 20% Si, 20% Mn, 20% Al, f.o.b. Philo, Ohio, freight allowed per lb.
Carload, bulk lump ... 18.50¢
Ton lots, packed lump ... 20.50¢
Less ton lots ... 21.00¢

**Vanadium oxide,** 86-89% $V_2O_5$ per pound contained $V_2O_5$ ... $1.38

**Zirconium silicon,** per lb of alloy 35-40% del'd, carloads, bulk .. 26.25¢
12-15%, del'd lump, bulk-carloads ... 9.25¢

### Boron Agents

**Borosil,** per lb of alloy del. f.o.b. Philo, Ohio, freight allowed, B 3-4%, Si 40-45%, per lb contained B
2000 lb carload ... $5.50

**Ferro Zirconium Boron,** Zr 50% to 60%, B 0.8% to 1.0%, Si 8% max., C 8% max., Fe balance, f.o.b. Niagara Falls, New York, freight allowed, in any quantity per pound ... 30¢

**Corbortam,** Ti 15-21%, B 1-2%, Si 2-4%, Al 1-2%, C 4-5-7.5%, f.o.b., Suspension Bridge, N. Y., freight allowed.
Ton lots per pound ... 18.25¢

**Ferroboron,** 17.50 min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D, ton lots ... $1.20
F.o.b. Wash., Pa., Niagara Falls, N. Y., delivered 100 lb up
10 to 14% B ... .85
14 to 19% ... 1.20
19% min. B ... 1.50

**Grainal,** f.o.b. Cambridge, O., freight, allowed, 100 lb & over
No. 1 ... $1.05
No. 79 ... 50¢

**Manganese-Boron,** 75.00% Mn, 17.50% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd
Ton lots (packed) ... $1.46
Less ton lots (packed) ... 1.57

**Nickel-Boron,** 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, del'd less ton lots ... 2.15

# "Electric arc melting gives us improved metallurgical quality at an economic advantage," says Birdsboro Corporation.

Steel castings provide a wide range of selective materials, both as to chemical analysis and mechanical properties, which are suitable for application in various service and environmental conditions. The recent selection by Birdsboro Corporation of two new electric arc furnaces to replace open hearths and to complement existing arc melting facilities has contributed markedly to diversification of their steel foundry operations to meet these requirements.

Demand has been matched with flexible melting capacity through installation of two Heroult Electric Arc Melting Furnaces:

| Shell Size | Capacity | Melting Rate |
|---|---|---|
| 8-foot | 10-ton | 2 tons per hour |
| 13.5-foot | 30-ton | 7 tons per hour |

These two furnaces increase total electric melting capacity to 300 tons per day.

Service to customers was the primary requisite in Birdsboro's selection of this equipment. In addition, sales possibilities have increased, quality of metal is superior, alloy recovery is higher, maintenance is reduced, and man-hours per ton is lower. Result—steady improvement of steel melting costs.

American Bridge constructs furnaces for all types of arc melting, in charge capacities to over 200 tons. You can select door-charge or swing roof top-charge types. Your crew can easily maintain a Heroult furnace.

If you're after melting flexibility, increased production, and lower costs, check American Bridge's complete design, construction and installation service.

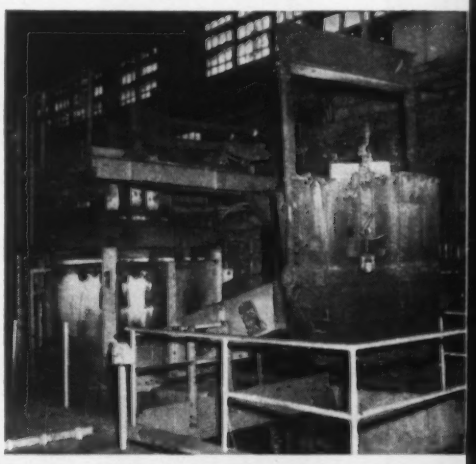
*USS is a registered trademark*

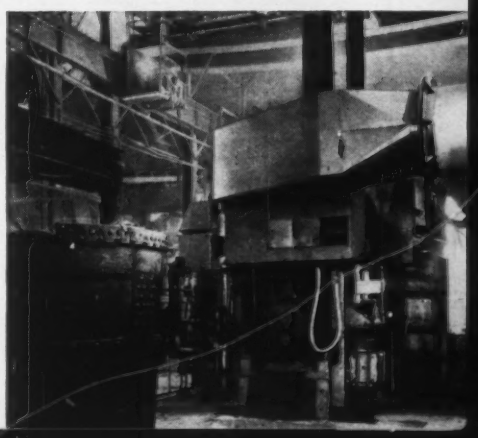
General Offices: 525 William Penn Place, Pittsburgh, Pa. Contracting Offices in: Ambridge • Atlanta • Baltimore Birmingham • Boston • Chicago • Cincinnati • Cleveland • Dallas • Denver • Detroit • Elmira • Gary • Harrisburg, Pa. Houston • Los Angeles • Memphis • Minneapolis • New York • Orange, Texas • Philadelphia • Pittsburgh Portland, Oregon • Roanoke • St. Louis • San Francisco • Trenton • United States Steel Export Company, New York

**American Bridge Division of United States Steel**

USS

This mark tells you a product is made of modern, dependable Steel.





HARCON-LIPSETT
LIQUIDATING
at 201 Rover St., Everett, Mass.
500 TON/DAY BLAST FURNACE
108 KOPPERS COKE OVENS
2 PUSHER MACHINES

CARS
800 Cu. Ft. Larry 14'8" Ga. 230V. DC (2)
65 Ton Hot Metal Std. Ga. w/65 Ton Ladles (4)
50 Ton Slag Std. Ga. w/300 Cu. Ft. Ladles (2)
50 Ton Slag Std. Ga. w/260 Cu. Ft. Ladles (2)
50 Ton Transfer Std. Ga. 230V. DC
10 Ton Quenching Std. Ga. 41'6" Wheelbase

OVERHEAD CRANES 230V. D.C.
110 Ton Cleveland Ladle 48'5" Span
20 Ton Shaw 41'7" Span, Cab Oper.
10 Ton Shaw 52' Span, Cab Oper.
10 Ton Bedford ¾ Yd. Bucket 61' Span

ELECTRIC BRIDGE 230V. D.C.
Traveling on Rail, 230' Span, plus 80' Cantilever, 6 Ton Bucket, Single Trolley, Motor Driven

MISCELLANEOUS
Penna. HAMMERMILLS SX13 400HP (3)
Koppers 2 Roll CRUSHER 36"x42", 40 HP
Trimmer CONVEYOR 30"x13'3" c/c Cleated
100 Ton PRINTOMATIC Larry Car SCALE, 14'8" c/c Rail
50 Ton 60' Platform Printomatic TRUCK SCALE
30 Ton 40' Platform Printomatic TRUCKSCALE
CAR HAULS Drum Type 20"x18", 25 HP
SKIP HOIST Lidgerwood 178'
MOTORS, DC Type CO & MD Series & Compound Wound 230V. 1 to 200 HP (100)
MOTORS AC 3/60/440V. Squirrel Cage & Slip Ring 1 to 100 HP (100)

Representative on Premises DUnkirk 9-3380

Write for Catalog

SALES AGENT
HEAT & POWER CO., INC.
60 E. 42 St., N. Y. MUrray Hill 7-5280

PRECISION
GROUND
SHAFTING

. . . is better and costs less when Universal supplies it.

Request 16-page catalog ▶

UNIVERSAL GRINDING CORP.
2200 Scranton Rd., Cleveland 13, O.

3000/4500 TON BLH
HIGH SPEED FORGING
PRESS NEW 1954
DIAMETER OF RAM 62"
STROKE OF RAM 40"
2—17" DIA PULLBACKS
MOVING DOWN TYPE
WITH INTENSIFIER
SN S.O.520500-1-2-3
WT. 620,000#
FRACTION OF ORIGINAL COST
POLLOCK INDUSTRIES INC.
S. KEIM ST., POTTSTOWN, PA. FA 3-5500



# March Sales Reflect Gains

**Used machinery dealers are looking for steady sales gains through the rest of the year.**

**February brought a sales slump. But March showed gains.**

■ Despite a definite slump in February, used machinery dealers are looking for better sales through the rest of the year. And the gain is already reflected in March sales.

According to statistics just released by the Machinery Dealers National Assn., March sales were up 18.2 pct over February. They were also 8.3 pct higher than March, 1960.

The February dropoff came after a sales "boom" in January. Statistically, here's what happened: Sales in January climbed 44 pct above December, 1960. Used machinery sales that month were also 41.8 pct higher than January last year. But they dipped more than 33 pct in February.

**The Reasons** — R. K. Vinson, executive director, MDNA, explained the sales drop this way: "Many used machinery buyers make their purchases in the beginning of the year. This was largely responsible for the big gain in January this year. Then a combination of factors—depression talk, extremely bad weather, and a very natural dropoff—caused February's sag."

Mr. Vinson told the IRON AGE sales should pick up now. He says "business will probably be steady through the rest of the year."

He also notes that "inventories are better than they've been for a long time and, in most cases, deliveries can be made immediately."

**More Stock** — The number of units in dealers' inventories has been gaining steadily since the first of the year. This number was up 13.2 pct in March over February. Another item worth noting is that the number of machine tools invoiced at $200 or more by dealers climbed 5.1 pct in March. In January and February, this figure had dropped.

Also, the March gain in used machine sales covers only sales where the ultimate user was invoiced. It does not include sales to other dealers, or new machines.

An interesting phase of February's activity: While recession talk may have hurt some used machinery dealers, it definitely helped others. There is a natural tendency among buyers to hold back on new machinery outlays when business is slow. So, they buy used tools. Most dealers in New York, for example, say recession fears boosted their sales in February.

**Testing Period** — Many dealers now feel the testing period by industry is over. A Philadelphia toolman notes: "We've been hit with an election, world tensions and a recession in the past six months. Some of these factors are past or easing. Also, many industries, now that the first quarter is over, can better gage the rest of the year. They'll start thinking of capital outlays to meet the year's commitments."

A dealer in Chester, Pa. agrees. He says "Customers haven't really spent all they're going to on machinery this year. I think now that we're pulling out of a recession, money will start to flow again."

**BALER**
#90TC Galland Henning, Bale Size 13x17x20"
**BENDING ROLLS**
13' x 3/16" Bertsch Initial Type
10' x ¼" Wickes Pyramid Type
**BRAKES**
16' x 5/32" Dreis & Krump Press Type #516D
12' x ⅛" Dreis & Krump Leaf Type
**CRANE—GANTRY**
15 ton Champion 100 ft Span 550/3/60 A.C.
**CRANES—LOCOMOTIVE**
40 ton Browning Diesel 60 ft. Boom
35 ton Brownhoist Diesel 50 ft. Boom
**CRANES—OVERHEAD ELECTRIC TRAVELING**
3 ton P & H 56'8" Span 220/3/60 A.C.
10 ton S-N 49'10" Span 220/3/60 A.C.
10 ton P & H 55' Span 220/3/60 A.C.
With two 5 ton Trolleys
10 ton Shaw 125' Span 230 Volt D.C.
With "A" Frame Runway
15 ton P & H 48'6" Span 220/440 A.C.
**FURNACES**
Bell Type Gas Fired Coil or Sheet Annealing Furnace 16'4" L 6'11" W 7'6" H
Size RT Type 5 Moore Lectromelt Furnace
**HAMMERS**
2000# Chambersburg Model E Steam Drop
6000# Chambersburg Dble Fr Steam Forging
8000# Chambersburg Dble Fr Steam Forging

**LEVELERS**
Budd McKay Flex Roll Processor, 11 Leveling Rolls center backed up, Rolls 96" wide x 4¼" Diameter
54" Bliss, 5 Rolls, 8" Dia.
54" Aetna Standard 17 Rolls 3¾" Dia.
66" Guide Co. 17 Rolls 4½" Dia.
**PRESSES—HYDRAULIC**
500 ton Williams & White 4-Col., Stroke 40", Bed Area 72" x 96"
4500 ton B-L-H, Down Moving, Stroke 40" 68½" x 68½" Between Columns
**PUNCH & SHEAR COMBINATIONS**
#2½ Buffalo Universal Ironworker, Capy. Punch 1"x⅞", Shear 2¼" Rd. 2" Sq. 6x6x½" Angles, With built in coper and notcher
Cleveland Type W Single End, 312 ton Capy. 60" Throat, Arch. Jaw, Attachments
**ROLLS—FORMING**
5 Stand Yoder 3" Dia. Spindle, With rolls for corrugating sheet steel
Forming Rolls Only, for metal floor and roof deck—approx. 5 tons—NEW
**ROLLING MILLS**
Bliss Cluster Mill 7⅜"x16" work rolls 14"x16" back up rolls, A.C. Motor Drive
26"x66" Two Stand Cold Mill Train
29" Diameter Hot Sheet Finishing Mill
22" & 20"x62" Lewis Sheet Roughing Mill

**SHEAR—BEAM**
Pels DT-35-B Beam Shear, Capy. 3" to 15" beams & channels, 6x6x⅝" angles
**SHEARS—MISC.**
60" McKay Cut-to-Length Line, Capy. 12 Ga. with leveler, shear and table
60" Guide Cut-to-Length Line, Capy. 8 Ga. with leveler, shear and table
**SHEARS—SQUARING**
8'x¼" Niagara Squaring Shear
10'x½" Cincinnati Squaring Shear
**SLITTING LINE**
48" Yoder Coil Slitting Line Complete, 6" Arbor. Capacity 4 Cuts ¼"
**STRAIGHTENERS**
Blaw-Knox Medart #000 2-Roll Rotary
Lewis #8-C Straightener & Cut-Off
7-Roll Angle & Bar Straightener for 4" Sq. and 6x6x½" Angles
**TUBE MILL**
Yoder No. HL-4 Tube Mill, Capy. ¾"-4"
**WELDER**
Peer Aluminum Welder Model P-100-12 Press Type 100 KVA, 220/3/60
**WIRE MACHINERY**
#2 Vaughn 12-Die Continuous Wire Drawing
Syncro HS1-A Hi Speed 7 Bay Tubular Strander
Syncro 61 Bobbin Planetary Strander

● Manufacturing **A. T. HENRY & COMPANY, INC.** Equipment ●
78 OXFORD BLVD., GARDEN CITY, L.I., N.Y.
Telephone Pioneer 7-4652

## VARIABLE VOLTAGE DRIVES
**3 PHASE 60 CYCLE**

| Quan. | Size | Description |
|---|---|---|
| 2 | 3000 HP | DC MOTORS—525 V. 600 RPM Whse. M.G. Sets—2500 K.W. Whse. 2300/4160 V. |
| 1 | 2750 HP | DC MOTOR 450 V. 300 RPM Elliott 2200 K.W., Gen. Elec. 3 unit 450 V. DC Gen. with 3000 HP 720 RPM, 2300 V. AC Motor and Etc. |
| 1 | 2250 HP | DC MOTOR 600 V. 400/500 RPM, G.E. M.G. Set—2000 K.W. G.E. AC Motor—2300 V. |
| 1 | 1500 HP | DC MOTOR 600 V. 600 RPM Whse. M.G. Set. 1500 K.W. G.E. 13,200 V. |
| 1 | 1500 HP | DC MOTOR 600 V. 300/700 RPM Whse. M.G. Set—1500 K.W. G.E. 13,200 V. |

For listing of Motors, Generators, Transformers, M.G. Sets, Rectifiers, Mill Motors, etc.
See last week issue.

*Write — Phone — Wire*
**BELYEA COMPANY, Inc.**
47 Howell St., Jersey City, N. J.
Tel. Oldfield 3-3334

## PRESSES
## BRAKES SHEARS
*Will Lease or Furnish Long Terms*
JOSEPH HYMAN & SONS
2600 E. Tioga St., Philadelphia 34, Pa.

6' x 10 Ga. Niagara Power Shear.
No. 3 Niagara Angle Bending Roll, M.D.
6" x 6" x 1" Cleveland Double Angle Shear.
6' x ⅜" Cincinnati Power Press Brake.
No. ½, No. 1½ Buffalo Univ. Ironworkers, M.D.
No. 5 Johnson Geared O.B.I. Press. Late.
6' x ¼" Lawn Initial Bending Roll, M.D.
**FALK MACHINERY COMPANY**
320 St. Paul Street, Baker 5-5887, Rochester 5, N. Y.

## CRANE
**10 TON NORTHERN ENGINEERING CO.**
**OVERHEAD TRAVELING BRIDGE CRANE**

| | |
|---|---|
| 46'8" Span | 18' Lift |
| 220/3/60 Electrics | Floor Operated |
| Pendant Control | Fish Belly Type |
| Budgit Bridge Drive | 36" Head Room |

Inspection In Operation
**PRICE $4,950.00 NET**
**F.O.B. CARS PITTSBURGH**
**LANG MACHINERY COMPANY, INC.**
28th St. & A.V.R.R. Pittsburgh 22, Pa.
GRant 1-3594

# FOR SALE

Proposals Invited For The Purchase Of All Physical Assets Except Land And Buildings Of

## THE KANSAS CITY & KAW VALLEY RAILROAD COMPANY

An electric line railroad running from Kansas City, Kansas, to Bonner Springs, Kansas, approximately 14 miles long, including rails, ties, poles, transmission wire, rotary converters, electric locomotives, misc. steel, shop tools, and other equipment.

Sale to be made of all property in place with purchaser to remove from the premises. All proposals to be for entire amount of property for sale.

**PROPOSALS TO BE RECEIVED IN WRITING NOT LATER THAN MAY 15, 1961.**

For further information and inspection contact

Hugh J. Zimmer, Secretary
Liquidation Enterprises
512 Board of Trade Building
Kansas City, Missouri
Telephone BAltimore 1-2200

# PLATE ROLLING MILL

We offer the Mill Facility, Equipment and Material of the former Phoenix Steel Corp. Plant located at Harrisburg, Penna. Listed below are some of the principal equipment units of this Plate Making Facility. Much of this Mill Equipment was built and installed in 1949. In addition there are thousands of items of factory and mill equipment, tools and supplies.

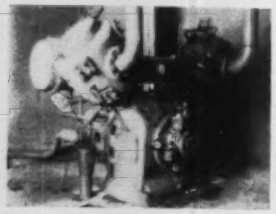
We offer as well, several Modern Mill Building Structures complete with runways. These are available completely matchmarked with detailed plans for re-erection.

These facilities, equipment and material are available at substantial savings. We solicit your inquiry and inspection. Specifications, drawings, photographs and prices will be furnished upon request.

LIPSETT DIVISION
LURIA BROTHERS & CO., INC.

**ACETYLENE GENERATORS**
(1) 500 lb. Air Reduction
(4) 300 lb. Air Reduction

**AIR COMPRESSORS**



*Chicago Pneumatic YCM-575 CFM Air Compressor*

(1) CP, YCM 13½-8x7 100 HP S/N 48621 Yr. 1948
(1) CP, 16"x10"x12" 2 STAGE 125 HP S/N 6208
(1 IR, 15"x9¼"x12" 2 STAGE 125 HP S/N 91189/9
(1) IR, 6"x5" 1 STAGE 10 HP S/N 66593 Yr. 1947
(1) CP, 1 STAGE 50 HP S/N 13565

**BUCKETS—CLAM SHELL**
(1) 4 Cu. Yd. Blaw-Knox
(4) 1 Cu. Yd. Blaw-Knox

**ELECTRICAL MATERIAL**
Wire, Cable, Fittings, Resistance Grids, Starters, Switches, Line Pole Material, Insulators, etc.

**FASTENINGS**
Nuts & bolts, rivets and nails.

**FIRE BRICK, CLAY AND CEMENT**
Assorted fire brick and refractory materials.

**FURNACE CHARGERS**

**OPEN HEARTH FURNACE CHARGERS**
(2) Open Hearth Furnace Charger, 5 Ton Capacity, Morgan Eng. Co., Wheel Span 22'-8"; Bridge Motor 50 HP; Trolley Motor 25 HP; Rotate Motor 11 HP; 230 V DC.

**HEATING FURNACE SLAB OR INGOT CHARGERS**
(2) Heating Furnace Chargers, 4,000# Capacity, Brosius Mfg. Co., Floor Type; Trackless; Rubber Tires; Electric Motor Driven, 230 V DC.

**FURNACE EQUIPMENT**
(30) Open Hearth Door Hoists, 2 Ton —230 V. DC., with controls.
(14) Water cooled open Hearth doors and frames (new).

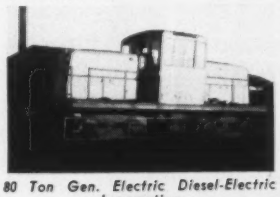
**HOISTS**
(30) Shepard-Niles 2 Ton 230 V. DC.
(11) Yale & Towne Cable King Hoists 2 Ton
(4) Yale & Towne Cable King Hoists 4 Ton
(8) Yale & Towne Spur Gear Chain Blks. 2 Ton
(4) Yale & Towne Spur Gear Chain Blks. 5 Ton
(1) Manley 1 Ton 48" boom Goose-neck portable Monorail, trolleys, reels, wall and column jib cranes.
Most items less than ten years old.

**LADLES—Open Hearth**

*150 Ton Open Hearth Ladle*

(8) Pollock Ladles, bottom pur 150 Ton Cap.
(3) Whiting Ladles, Lip pour 40 Ton Cap.

**LOCOMOTIVES**



*80 Ton Gen. Electric Diesel-Electric Locomotive*

(1) 80 Ton GE Diesel Electric Std. Ga. 1953
(1) 65 Ton Whitcomb Diesel Elec. Std. Ga.
(1) 50 Ton GE Diesel Electric Std. Ga. 1948
(1) 20 Ton Plymouth Diesel 36" Ga. Cummins
(1) 20 Ton Plymouth Gasoline 36" Ga. LeRoi

**MACHINE SHOP EQUIPMENT**

**BOLT THREADERS**
(1) Landis 2", Motor Drive, Extra Dies
(1) Acme, 2", Motor Drive, Extra Dies

**BORING MILL**
(1) Betts, 72", 2 Hds. 48" Under Rail, Motor and Controls

**DRILL PRESSES**
(12) Floor-type, Delta—15" and 17"
(1) Box Columnar-typ, Buffalo 22ft—1¼" cap.

**GRINDERS**
(14) Double Disc, Delta, U. S., Cincinnati

**HACK SAWS—Power**
(1) Peerless, 10"x10", Mtr. Drive, 3 Spd., Vise, Coolant, Conveyor Tble. 5'x12" Wide.
(1) Peerless, 9"x9", Mtr. Drive

**KEYSEATER**
(1) Mitts & Merrill, #5, Mtr. Drive, Cutters, Tools

**LATHES—ENGINE**
(1) Schumacher-Boye 36"x17', Mtr. Drive, 16 Speed, Qk. Chng. Gear, Chuck, Stdy. Rest
(1) American 27"x11', Mtr. Drive, 12 Speed, Qk. Chng. Gear, Chuck, Tpr. Attch, Stdy. Rest
(1) American 24"x13', Mtr. Drive, 12 Speed, Qk. Chng. Gear, Chuck
(1) Sebastian, 20"x10'6", Mtr. Drive, 8 Speed, Qk. Chng. Gear, Tpr. Attach., Thrd. Dial, Chuck, Rest
(1) American 18"x8', U. S. Varidrive, Qk. Thrd. Attach., Dial Ind, Chuck
(1) American 18"x8', Mtr. Drive, 12 Speed Qk. Chng. Gear, Chuck, Rests, Dogs
(1) Lodge & Shipley 16"x52", Mtr. Drive, 12 Speed, Qk. Chng. Gear, Thrd. Dial, Chuck, Rest.

**MILLING MACHINE, HORIZONTAL**
(1) Cincinnati, #4, Universal, Vertical Attachment, 16 Speed, Motor and Controls

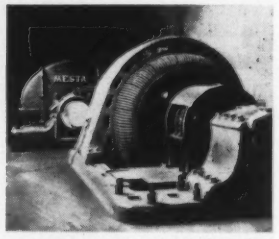
**PLANERS**
(1) Cincinnati, "Rapid-Traversa", 48"x 48"x18', 2 Rail Hds, 2 Side Hds, 35 HP Motor and Controls
(1) Gray, 36"x36"x8', 2 Rail Hds, 2 Side Hds, Motor and controls

**SLOTTER, VERTICAL**
(1) Newton, 18" Stroke, 42" Tble. Dia. U. S. Varidrive and controls

**MATERIALS HANDLING EQUIPMENT**
Wide range lift trucks and front loaders —Yale & Towne, Towmotor, Clark, Caterpillar.—Roller & Transfer Beds

**METALLURGICAL HOT BLAST CUPOLA**
Rated 15/20 tons/hr. Shell dia 8'-11"; hearth dia 7'0"; stack height 40'; (12) water cooled tuyeres 3.81" dia. Heat exchanger for preheating 12,000 CFM to 950/1000°F. with Allis Chalmers blowers, motors, controls. Charging equipment, cyclone dust collector, piping, valves, operating and control instrumentation. Installed 1954.

**MILL DRIVE**



*3000 HP General Electric Slip Ring Motor Reduction Gear Mill Drive 78 RPM OUTPUT*

(1) 3,000 HP General Electric Slip Ring Motor, 2,300 Volt, 60 Cy., 3 PH., 358 RPM with Comp. panel, and lub. system, air wash sys. Coupled to Mesta 4.8:1 Red. Gear-output speed 78 RPM.
(9) 1500 HP Westinghouse Motors 600 RPM Shunt wound 525 Volts, Totally enclosed. Class B insulation.
(4) Allis-Chalmers Generators, 1200 KW for above 525 Volts D.C. Totally enclosed self-ventilated. 2290 Amp.; 750 RPM

**MOTOR-GENERATOR SETS**
(1) 1,250 KW General Electric, Motor 1,750-HP, 2,300 Volts, 60 Cycle, 3 Phase, Synchronous .8 pf. 720 RPM-Gen. 1,250-KW, Type MCF, 4,625 amp. 270 Volts D. C.
(1) 1,000-KW General Electric, Motor 1,400-HP Snychronous AT 12,300 Volt, 60 Cycle, 3 Phase.-Gen. 1,000-KW, 1,667 Amp. 600 Volt D. C., 720 RPM.
(1) 500-KW Westinghouse, Motor 750-HP, Synchronous, 2,300 Volt, 60 CYCLE, 3 Phase 720 RPM.-Gen. 500-KW, 1,817 AMP 275 Volt D. C.

**MOTORS**
A.C., D.C., Squirrel Cage, Crane & Mill, Traction, Vertical Pump.

## BUILDINGS FOR RE-ERECTION

| SPAN C/C OF COLUMNS | LENGTH | HEIGHT TO BOTTOM OF ROOF TRUSS | HEIGHT TO TOP OF CRANE RAIL | SPAN C/C CRANE GIRDERS | CRANE CAPACITY |
|---|---|---|---|---|---|
| 80'-0" | 110 Ft. | 32'-0" | 23'-6" | 76'-10" | 25 Ton |
| 72'-6" | 200 Ft. | 46'-6" | 22'-7½" | 68'- 0" | 25 Ton |
| 70'-0" | 288 Ft. | 30'-0" | 21'-6" | 68'- 3" (2) | 10 Ton 15 Ton |
| 70'-0" | 272 Ft. | 38'-0" | 29'-6" | 69'- 4" (2) | 10 Ton 20 Ton |
| 50'-0" | 160 Ft. | 32'-0" | 23'-6" | 46'-10" | 20 Ton |
| 28'-9" | 66 Ft. | 22'-6" | 16'-0" | 26'- 1" | 5 Ton |

**CHAIN BLOCKS**
Chain blocks, chokers, slings, wire rope and fittings.

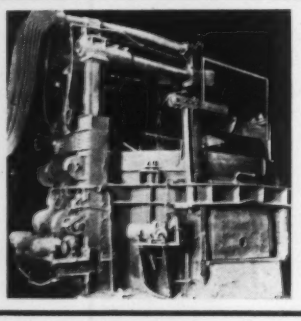
## CRANE RUNWAYS OUTDOOR

| LENGTH | SPAN C/C CRANE GIRDER | HEIGHT | CAPACITY | CRANES AVAILABLE |
|---|---|---|---|---|
| 660'-0" | 65'-0" | 23'- 0" | 25 Ton | (2) 20/5 Ton Milwaukee Shaw-Box |
| | | | | (1) 10 Ton Milwaukee |
| 144'-0" | 60'-0" | 25'-10" | 10 Ton | (2) 10 Ton Alliance |

**CIRCLE CUTTER**
Whiting Quickwork—56" Throat: Min. circle 20" dia.; Max. circle 112"; Max. thickness ¾" plate.

**ELECTRIC ARC MELTING FURNACE**

**HEROULT Model 15 Electric Arc Melting Furnace. Shell Diameter 14'-0"; Inside Diameter 12'-0" Side Charge. Cold scrap charge 30,000#/40,000#. Electrode size 14" diameter x 60" long. Transformer General Electric 6000 KVA Primary Voltage 13,200/26,400, Sec. 265/92 volts; built in reactor. GE Automatic Control Panel. Westinghouse tot. encl. drawout switchgear. With approx. 160 spare electrodes and nipples, door frames, rings motors, etc. S/N 236 Mfd. Heroult Div. U. S. Steel Corp.**

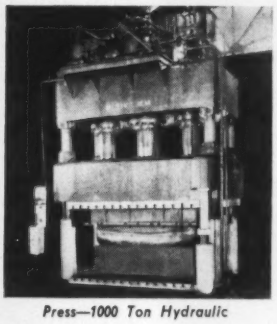


# LIQUIDATION

## OVERHEAD TRAVELLING CRANES

| | | |
|---|---|---|
| (1) | 150 Ton/40 Ton Morgan | Ladle Crane 59'-6" Span |
| (1) | 100 Ton/25 Ton Wellman | Ladle Crane 59'6" Span |
| (1) | 40/25 Ton Milwaukee | Crane (1951) 59'-8" Span |
| (1) | 25 Ton Milwaukee | Crane (1949) 68'-0" Span |
| (1) | 20 Ton Milwaukee | Crane 69'-4" Span |
| (2) | 20/5 Ton Shaw Box | Crane 65'-0" Span |
| (1) | 20 Ton Milwaukee | Crane (1949) 46'-10" Span |
| (1) | 15 Ton Northern | Crane 69'4" Span |
| (2) | 15 Ton Morgan | Crane 64'-6" Span |
| (1) | 10 Ton Alliance | Crane 70'-0" Span |
| (1) | 10 Ton P & H | Crane 69'-4" Span |
| (1) | 10 Ton Shaw Box | Crane 69'-4" Span |
| (1) | 10 Ton Shaw Box | Crane 64'-6" Span |
| (1) | 10 Ton Alliance | Crane 64'6" Span |
| (1) | 10 Ton Milwaukee | Crane 65'-0" Span |
| (2) | 10 Ton Alliance | Crane 60'-0" Span |
| (4) | 10 Ton Alliance | Crane 56'6" Span |
| (1) | 5 Ton Alliance | Crane 64'-8" Span |
| (2) | 5 Ton Alliance | Crane 61'-6" Span |
| (1) | 5 Ton Cleveland | Crane 56'6" Span |
| (1) | 5 Ton Northern | Crane 44'-6" Span |
| (2) | 5 Ton Alliance | Crane 40'-4½" Span |
| (1) | 5 Ton Phoenix Stl | Crane 35'-0" Span |
| (1) | 15 Ton Milwaukee | Bridge Only (1949) 70'-0" Span |

Spare Trolley's, 5 ton, 10 ton, 15 ton; contractor panels; cab controls; Resistance banks.



*Press—1000 Ton Hydraulic*

## PIPE & TUBING

Pipe & Tubing (New & Used), fittings (Steel & Brass) Valves, Packing Material.

## PIPE MILL

PIPE MILL INSTALLATION FOR PRODUCTION OF BUTT-SUBMERGED ARC WELDED PIPE, 18" to 36" DIAMETER, MAXIMUM WALL THICKNESS ½". Pipe Mill manufactured by the Kane Boiler Works, 1948. Rated 9,000/10,000 tons per month. Will handle up to 40' lengths. This mill consists of Rotary Plate Shear 96" Max. width; Initial Edge Crimper; 1,500 Ton Hydraulic Forming Press; (3) Weld Clamping Machines and Jigs; Automatic Welding Heads; Inside Welding Machines; Pipe Expander and Tester; Flux Recovery System. Also Included are: Hydraulic Pumps; Filling Pumps; Transfer Tables; Motor Controls; Switchgear; Tinius-Olsen 100,000# Testing Machine; Welding Machines and other Auxiliary Equipment. Drawings, Diagrams and Layouts of the Mill Installation are available for inspection.

## PUMPS, FANS & BLOWERS

Full assortment of centrifugal, Low and High pressure water pumps; deep well pumps; fans to 50,000 C. F. M.

## RAILROAD TRACK AND ACCESSORIES

TRACK (New & Used) switches, frogs, guard rail, switch points—85# & 100# rail.

## ROLL LATHES

(1) Pond—60" Face Plate; 41'-6" Centers; 12' tool holder; with floor plate milling att.
(1) Fifield—60" Face Plate 14'-0" Centers with floor plate milling attach.
(1) Garrison—40" Face Plate; 12'-8" Tool Holder; 12' Centers; 10 HP Drive.

## ROLLING MILL EQUIPMENT

*43" Edger Mill—Pemco—72"x18" Billet —1000 H.P.*

### SLAB EDGER MILL

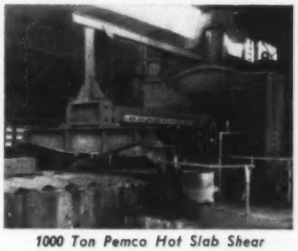
(1) Slab Edger Mill, Pittsburgh Engr. Co., S/N 48147 (New 1949). Capacity 72" x 18" thick slab, Roll Size (2) 43" Diameter x 24" Working Surface-Alloy Steel. Motor Drive 1,000 HP & reduction gear. Complete with starter, Controls, Etc. (1) MG Set, General Electric, 1,000 KW, Generator-600 V DC 1667 Amperes. Motor-1,400 HP 2300/3/60.

(1) Birdsboro 34" Blooming and Slabbing Mill, 72" Wide, 2 High, Reversing, 28" x 66" Ingot, Minimum Thickness 2", Maximum Lift 28", Maximum Ingot Weight 30,000# (Approx.), Approach Table 38' Long, Run-out Table 26' Long. Both Tables Motor Driven 50 HP 230 V DC; Hydraulic Slab Shear, Pittsburgh Engr. Co., S/N 48148, New 1949; Capacity 1,000 Tons, 6" Thick x 60" Wide Steel Slab (Hot); Hydraulic Pump, 8 Stage Bingham, 500 gpm @ 1,440 psi, Motor Drive—600 HP 2,300/3/60. Starter, Controls, Etc.

(1) Birdsboro 126" Plate Rolling Mill, 126" Wide, 3 High, 34" Dia. Rolls, 15" Maximum Lift, Minimum Thickness 3/16". Maximum Slab or Ingot Size 115" Wide x 15Q Thick, Maximum Weight 22,000# (Approx.). Tilting Tables, Front and Back; 3,000 HP Electric Motor Mill Drive. Runout Table 54' Long to Plate Leveller; Plate Leveller, 11 Driven Rolls, (5 Upper and 4 Lower), 148" Between Housings, Motor Drive—50 HP 230 V DC.

(1) Birdsboro 89" Plate Rolling Mill, 89" Wide, 3 High, 25½" Dia. Rolls, 15" Maximum Lift, Minimum Thickness 3/16". Maximum Slab or Ingot Width 72" Maximum Weight 4,400# (Approx.). Tilting tables Front and Back; Runout Table 45' Long to Plate Levellers; 2 Plate Levellers, 6 Upper and 5 Lower Work Rolls, Motor Drive—55 230 V DC.

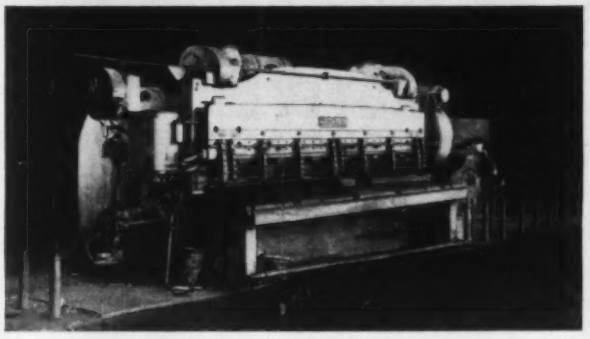
(1) Birdsboro 42" Universal Plate Rolling Mill, 2 High, Reversing, Maximum Lift 26", Maximum Width 42". Minimum Width 7". Minimum Thickness ¼", Maximum Weight 14,000# Ingot (Approx.). Vertical Side Rolls each Side of Mill Housings for Rolling Plate Width. Front Mill Table 45' Long, Back Mill Table 33' to Plate Leveller; Plate Leveller, 9 Work Rolls (4 Upper and 5 Lower), Motor Drive 75 HP 230 V DC. Plate Shear, 48" x 2" Thick (Cold), Motor Drive 50 HP 230 V DC.



*1000 Ton Pemco Hot Slab Shear*

## SHEARS

1,000 Ton HOT UPCUT SLAB SHEAR Capacity 6" thick x 60" wide, stroke 12½", 8 cuts per min., 32" hyd. hold down clyinder, 1320# w.p., 600 HP Bingham Pump and motor drive. Auto. Length of cut gauge, adj. from 30"/120" length of cut. Approach and runout tables, crop kickoff, operator pulpit, relate and control panels. Man. Pittsburgh Engineering and Machine Co.—1949.



*1" x 12' Cincinnati Plate Shear*

**2"x48" United Eng. & Fdy. 1"x12' Cincinnati Model 10012—(1951). ¾"x9' Hilles & Jones. ½"x5' Cincinnati P & S**

## SCALES

(1) Fairbanks Morse, Track, 150 Ton, 56' Wghrail, 56½" Std Ga., Type S-12½-75. Dead Rail, Tare & Gross Adj on Tkt Printer.
(1) Streeter Amet Electronic, Track, 25 Ton 12'6" Wghrail, 56½" Std Ga., Type St-1064, Dial & Recorder.
(1) Howe, Track, 50 Ton, 25' Wghrail, 36" Ga., Type 9-50, Recording Beam.
(1) Fairbanks Morse, Truck, 50 Ton, 60' x 10' Concrete Deck, Type S. Dial.

## EDGE TRIMMING AND SLITTING SHEAR

Capacity 96" wide x 7/16" thick plate. Arbor 12" diameter, circular cutters 16" diameter x 2⅜" face. Cutting speed adjust. to 62 fpm. Drive 65 HP, 250/1000 RPM, 230 volt, DC., with operator's pulpit, controls, etc. Mfd. by Monarch Tool & Die Co., Milwaukee 1949. Approx. wt. 80,000#.

## SLAB TRANSFER CARS

(12) 50,000# Cap. Slab Transfer Cars, 101 long, 36" wide, 4 Wheel, Hyatt Roller Brgs., 36" Track Gage, Excellent Cond.

## STEEL

Plate, structural, pipe, tubing, New and used.

## TANKS

### STEEL STORAGE

(1) 268,000 Gal Vertical welded, 38'-6" diameter x 35'-4" high.
(1) 160,000 Gal vertical welded, 30'-0" diameter x 30'-6" high.
(1) 32,000 Gal Horizontal riveted, 14'-11" diameter x 28'-0" long.
(1) 6,000 Gal Vertical welded, 8'-0" diameter x 28'-4" long.
(1) 1,835 Gal Horizontal welded, 60" diameter x 12'-6" long. (New)
(1) 7,000 Gal Rectangular welded, 15'-0" L. x 9'-0" W. x 7'-0" H.

Air receivers, Hydraulic accumulators and vessels.

## TESTING MACHINES

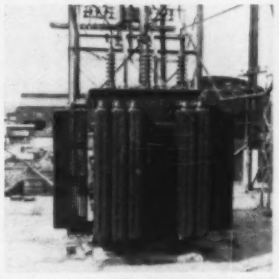
(1) Tinius Olsen Tensile Testing Machine 400,000#
(1) Tinius Olsen Tensile Testing Machine 100,000#

## TOOLS

Air grinders, paving breakers, hammers; hand tools, electric drills, saws and thousands of items of hand tools and factory and mill supplies.

## TRANSFORMERS

(1) 7500KVA Wstghse 66000 Pri. 13800 Sec 3 PH 60 S/N 4069568 Yr. 1948



*7500 KVA West. Transformer 6900-13800 Volt*

(1) 7500KVA Wstghse 66000 Pri. 2400 Sec 3 PH 60 S/N 4069567 Yr. 1948
(3) 2000KVA GE 13200/26400 Pri 2400/4150Y Sec 1 PH 60 S/N 2871432; 2871433; 287140
(3) 667KVA GE 2300/4000Y Pri 460 sec 1 PH 60 S/N 4497213; 4497213; 4497215
(3) 167 KVA GE 2400/4160Y Sec 240/480-60 CY 1 PH Sn. C 381487-56P 88-00, Rebuilt
(3) 150 KVA Wstghse 2400/4160Y Pri 120/240 Sec 1 PH 60 S/N 4399362, 4399370; 4399371
(1) 25KVA GE 1100/2200 Pri 120/240 Sec 1 PH 60 S/N 1371094
(1) 25 KVA Wstghse 2200 Pri 220/110 Sec 1 PH 60 S/N 385970
(1) 25 KVA Wstghse 2300 Pri 230/115 Sec 1 PH 60 S/N 1406895
(3) 175 KVA GE 2400/2160 Pri 203/101 Sec 1 PH 60 S/N 152339; 152540; 152341

## WELDERS

Motor-Generator and Transformer Type 200-300-600-1200 Ampere Size. Accessories-Cable, clamps, electrode holders, welding rod.

## WHEEL PRESS—HYDRAULIC

(1) 250 Ton, Plunger to End Plate 15'; Between Bars 44"; Ram Hd. 15" Dia., Perkins Hyd. Unit. Motor, Controls, Etc.

•

Write, Wire, Phone

**LIPSETT DIVISION**
**LURIA BROTHERS & COMPANY, INC.**

Liquidation Office
915 South Front St.
P. O. BOX 1151
HARRISBURG, PA.
PHONE: CEDAR 6-5988

ARNOLD L. LANDESBERG
PROJECT MGR.

EXECUTIVE OFFICES
161 East 42nd St. New York 17, N. Y.

AJAX Induction Mltg. Unit 700 KW—2 tons/hr. —Like New *including:* 6-500 lb. melting furnaces, 1000 Hp M. G. set, control panels, transformer, circuit breakers, complete.

*Send for complete details.*

**UNIVERSAL MACH. & EQUIP'T. CO.**
1630 N. 9th, Rdg., Pa., FR35103

# LOCOMOTIVE CRANES

2 Orton 25 Ton Locomotive Cranes with booms. Standard Gauge, Air Operated Cat D13,000 Diesels. These are Gov't Surplus, Show Little wear.

**Choice for $10,750.**
**Sell pair for $20,000.**
Located Boston Area.

**W. E. McCARTHY, INC.**
241 Mystic Ave. - Medford, Mass.
Tel.: EXport 6-3500

# ROLLING MILLS—STEEL WORKS EQUIPMENT

1—35" 2-HIGH BLOOMING MILL, with reversing motor, M.G. set, tables, manipulator.
1—3-HIGH PLATE MILL, 40" & 26½" x 112".
1—32" & 20" x 56" 3-HIGH SHEET MILL with motor driven screwdown and pre-set controls.
1—25" & 42" x 66" HOT STRIP MILL, 4-high.
4—29" 2-HIGH HOT SHEET MILLS, with tables.
1—16" x 28" COLD MILL, 2-high, 200 HP drive.
1—26" COLD SHEET MILL TRAIN, 6 stands, 400 HP motor and drive.
1—8" x 12" 2-HIGH COLD MILL, 50 HP motor.
1—24" 4-HIGH COLD STRIP MILL
1—3½" & 8½" x 5½" STRIP MILL, 4-high.
1—16" BAR MILL, 3-high, single stand.
1—9" BAR MILL, 3-high, five stands.
1—34" x 192" ROLL GRINDER.
1—STRUCTURAL STEEL BUILDING, Length 400 Ft.; span 59'6", height of crane rail 40', includes 75 ton D.C. crane.
1—VERTICAL OPEN-SIDE BAR SHEAR, 28" knife, capacity 1" x 24" or equal.
2—SQUARING SHEARS for ¼" x 156" sheets.
2—SQUARING SHEARS for 10 ga. x 120" sheets.
4—LEVELERS for sheets, 17 rolls, widths 24", 42", 48", 66", ROLLS 4" DIAM.
1—AUTOMATIC SQUARING SHEAR UNIT for sheets, 162" side cut, 72" end cut.
1—ROLL LATHE, ENCLOSED HEADSTOCK, up to 40" dia. rolls.
1—CORRUGATING MACHINE for sheets 144" long, 3 sets of removable dies.
1—HALLDEN STRAIGHTENING AND CUT-OFF MACHINE, capacity 5/16" to ⅝" dia x 14 ft.
1—POINTER, tube 2" O.D. x ¼" wall maximum.
1—1500 HP GEAR DRIVE, ratio 8 to 1.
1—1200 HP GEAR DRIVE, 295 to 30 RPM.
1—400 HP GEAR DRIVE, 8.2 to 1 ratio.
1—1500 HP MOTOR, 2300 volts, 3 phase, 60 cycle, 240 RPM.
1—600 HP MOTOR, 2300/4600 volts, 3 phase, 60 cycle, 450 RPM.
1—175 TON HOT METAL CRANE, 54' SPAN, 4 GIRDERS.
1—75-TON HOT METAL CRANE, 59' SPAN, 4 GIRDERS

COMPLETE MECHANIZED SHEET MILL CONSISTING OF CONTINUOUS FURNACES, 3-HIGH ROUGHING STANDS, 2-HIGH FINISHING STANDS, MILL TABLES, DOUBLERS, COLD MILLS, LEVELLERS, SHEARS, ANNEALING FURNACES, MECHANICAL PACK OPENER, ROLL LATHE.

**FRANK B. FOSTER, INC.**
2220 Oliver Building, Pittsburgh 23, Pa.
Cable "Foster, Pittsburgh" Telephone Atlantic 1-2780

OFFERING

# BRIDGE CRANES

**ARNOLD HUGHES COMPANY**
2765 PENOBSCOT BLDG. DETROIT, MICH.
WOodward 1-1894

**MACHINES FOR YOUR YARD**
Austin 8 ton roller
Adams Tandem Grader
American car puller
Vermeer ditcher 524-T
Link Belt shovel LS-85
Ford tractor w/Arps trencher

**TRACTOR & EQUIPMENT CO.**
10006 Southwest Highway, Oak Lawn, Ill.
Chicago Phone HI-1ltop 5-0600

**RR CARS, LOCOMOTIVES, CRANES**
25 & 50 Ton Amer. Loco. Cranes
100—70 ton cap. Covered Hopper Cars
400—50 ton cap. Coal & Ore Hopper Cars
28—Diesel Elec. Locomotives 25, 45, 65, 70 80, 100 & 115 ton G.E., GM & Alcoa

**STANHOPE, 60 E. 42nd St., N.Y. 17, N.Y.**

# UNIVERSAL Machinery & Equipment Co.

**• ARC MELTING FURNACES**
250# LECTROMELT—185 KVA
500# LECTROMELT—200 KVA
1000# SWINDELL—500 KVA
2000# SWINDELL—1000 KVA
3000# HEROULT, Door Charge
7' TOP CHARGE—2000 KVA
10' TOP CHARGE—4000 KVA
DETROIT FURNACES—10 lb. to 300 lb. Cap.

**• INDUCTION HEATING FURNACES**
10—50 KW to 200 KW TOCCO Units
10 KW WSTGH. 450 KC, 3 phase
20 KW THERMONIC Induction Heater 2 station
20 KW ECCO Induction Heater
15 KW GIRDLER Dielectric Heater

**• INDUCTION MELTING FURNACES**
30 KW VACUUM Melting, Complete—Like New
350 KW AJAX Melting
200 KW 960 cycle, 1000# steel
200# AJAX Production Vacuum Melting Unit —New in 1958.

**• HEAT TREAT FURNACES**
4'x4'x10' Gas Fired Box 1500°F.
7' G. E. Rotary Hearth Electric, 1900°F.
36" dia. x 36" deep Electric Recirculating
42" wide roller Hearth 50'L w/atmos. gen.
24"x16'Lx36"H 210 KW conveyor, 1400°F.
10"x12"x24" LINDBERG 2500°F. hydrogen
36"x96", 48"x144", 48"x120" Surface Combustion, gas fired

**• CLEANING EQUIPMENT AND GRINDERS**
15x20 WHEELABRATOR
20x27 WHEELABRATOR
27x36 WHEELABRATOR w/loader
36x42 WHEELABRATOR w/loader
48x42 WHEELABRATOR w/loader
48x48 WHEELABRATOR w/loader
48x72 WHEELABRATOR w/loader
*dust Collectors available for all machines*
#1A WHEELABRATOR Multi-table
WHEELABRATOR Pipe Cleaning Cabinet to 12" O. D.
6' LG PANGBORN Table
9' LG PANGBORN Table
72" WHEELABRATOR Swing Table
6' LK PANGBORN Table Room
CHROME ORE PLANT inc. arc furnaces & all preparation equipment.

1630 NORTH NINTH ST. READING, PA. PHONE FRANKLIN 3-5103

## FOR IMMEDIATE SALE

48" Ingersoll Planer Mill, used Ingersoll 48" x 48" x 18 ft.
Type B Adjustable Rail Milling Machine. Serial 15709 New 1941. Two Swiveling Rail Heads and one R. H. Side Head. Table 42" x 18 Ft. Long, Main Drive 40 HP, 230 Volt DC Motor Generator Set Available also for This Machine.

**PRICE: $37,500.00**
*For Details or Inspection Write, Wire, Call:*
**STRUTHERS WELLS CORPORATION**
TITUSVILLE, PENNSYLVANIA
TELEPHONE 53211

## FOR SALE

64" x 60" x 18' SELLERS PLANO-TYPE MILL—Equipped with 2 Rail & 2 Side Individual M.D. Heads. Can be inspected in operation. Paul M. Volyn, 20 Arlington Avenue, Hawthorne, New Jersey. HA 7-2704.

## The IRON AGE Chestnut & 56th Sts., Philadelphia 39, Pa.

Please send me rates and general information about the Classified Section without obligation on my part.

Name ..... Title .....

Company .....

Street .....

City ..... Zone ..... State .....

I am interested in The Clearing House ☐, Equipment and Materials Wanted ☐, Employment Exchange ☐, Contract Manufacturing ☐.

**WANTED TO BUY**
**Steam Forging Hammers,** *all sizes*
250 and 300-ton Single or Double End Punch Presses, shallow throat preferred
300-ton Trimming Press with side shear
Swaging Machine, Cap. 2¼" solid
**Donahue Steel Products Company**
**1919 W. 74th St., Chicago 36, Illinois**

WANTED TO PURCHASE—any quantity
**CARBON—ALLOY—STAINLESS**
Bars—Billets—Sheet—Plate
**THE GILBERT MERRILL STEEL CORP.**
91 New York Ave., Westbury, L. I., N. Y.
EDgewood 3-7300

**WANTED**
(1) 14" AND (1) 24" DIA. ROLL LATHES COMPLETE WITH NECK AND PIANO RESTS AND TOPPING ATTACHMENTS. ADVISE PRICE, DELIVERY, LOCATION, AND CONDITION, ETC.
***Purchasing Dept.***
**HARVEY ALUMINUM, INC.**
**19200 SO. WESTERN AVE. TORRANCE, CALIFORNIA**

**WEISS STEEL CO. INC.**
600 WEST JACKSON BLVD.
CHICAGO 6, ILLINOIS
*Buyers of Surplus Steel Inventories*
39 Years of Steel Service

**SURPLUS STEEL**
NEW *WANTED* USED
*Structurals, Plate, Pipe and Tubing*
*Consumers Steel & Supply Co.*
P. O. Box 270, RACINE, WISCONSIN

**High Speed Steel Bars**
All Types And Sizes Wanted
HIGHEST PRICES PAID
**PRODUCTION CARBIDE & STEEL CO.**
**11311 E. 8 Mile JE 9-1660 Warren, Mich.**

**WANTED**
**SURPLUS STEEL**
**WALLACK BROTHERS**
7400 S. Damen Ave. Chicago 36, Illinois
GROVEHILL 6-7474

**WANTED**
**STEEL BALLS**
**ALL TYPES & SIZES**
BOX H-180
c/o The IRON AGE, Chestnut at 56th, Phila. 39

**WANTED**
**BRIDGE CRANES**
**ARNOLD HUGHES COMPANY**
2765 PENOBSCOT BLDG. DETROIT, MICH.
WOodward 1-1894

**ADMINISTRATIVE SALES POSITION**
**STEEL TUBING MANUFACTURER**
Nationally recognized Mid-West steel tubing producer has an immediate opening for a man of executive calibre. 30-45 years old (preferred), with a current and thorough sales-technical background in electric resistance welded steel tubing. Attractive compensation with unusually fine incentive features. Submit complete resume giving personal history, education, experience and salary requirements. Replies held in strict confidence.
**BOX H-176**
**c/o The IRON AGE, Chestnut at 56, Phila. 39**

## EMPLOYMENT EXCHANGE

### Help Wanted

**MANAGER OF MANUFACTURING**

Nationally known New England multi-plant manufacturer of automatic and special machinery seeks Manager of Manufacturing for its New York State plant. Require diversified experience in management of machine shop and assembly operations of special machinery, including methods, tooling, and scheduling. Some sales background and customer service relationship desired. Engineering degree or equivalent. Starting salary about 14M. Excellent growth prospects. Send full particulars. All replies confidential.

**BOX H-179**
**c/o The IRON AGE, Chestnut at 56th, Phila. 39**

### Help Wanted

TECHNICAL SALES-SERVICE MAN. Midwest refractory manufacturer needs young man, with technical background, 5 years' experience in Open Hearth or Electric Furnace shop, to sell and service refractory products for steelmakers in Midwest and South. Good future prospects in expanding business. Give salary requirements and complete resume. Replies held confidential. Box H-181, c/o The IRON AGE, Chestnut at 56th, Phila. 39.

### Accounts Wanted

BUYERS MARKET SALES PROBLEMS? Are you faced with cutbacks & retrenching because price competition is forcing you to reduce overhead & sales expense? We are a Professional Industrial Sales Agency with Headquarters in the Greater Cincinnati area. We serve the Tri State Region including Indiana & Kentucky. Principals please write—Box H-182, c/o The IRON AGE, Chestnut at 56th, Phila. 39.

# ADVERTISERS IN THIS ISSUE

**An asterisk indicates that a booklet, or other information, is offered in the advertisement.**

**This index is published as a convenience. No liability is assumed for errors or omissions.**


A

*Acme Manufacturing Co. ..... 30
*Aetna-Standard, Div. Blaw-Knox Co. ..... 53
Ajax-Magnethermic Corp. ..... 12
Allen-Bradley Co. ..... 119-120
Allen Mfg. Co. ..... 56
*Aluminium Limited Sales Inc. ..38-39
American Bridge, Div. United States Steel Corp. ..... 177
*American Pulverizer Co. ..... 141
*American Shear Knife Co. ..... 22
*American Tool Works Co. ..... 10
Amplex Div. Chrysler Corp. ..... 145
Arwood Corp. ..... 46-47
Atlas Steels ..... 145
Avey Div. ..... 135

B

*Babcock & Wilcox Co., Tubular Products Div. ..... 4
Belyea Co., Inc. ..... 179
*Benchmaster Manufacturing Co. 27
Bertsch & Co. ..... 126
Bessemer & Lake Erie Railroad Co. ..... 155
Bethlehem Steel Co. ..... 1
*Blaw-Knox, Aetna-Standard Div. 53
Bliss, E. W. Co., Rolling Mill Div. 77
Bound Brook Oil-Less Bearing Co. 63
*Buffalo Forge Co. ..... 139

C

Carpenter Steel Co. ..... 34-35
Cincinnati Milling Machine Co., Cincinnati Milling Products Div. 100
Clark Controller Co. ..... 23
Clearing Div. U.S. Industries, Inc. ..... 79-86
*Cleveland Worm & Gear Div., Eaton Mfg. Co. ..... 66
Cone-Drive Gears Div., Michigan Tool Co. ..... 140
Crucible Steel Co. of America .. 129
*Curtiss-Wright Corp., Princeton Div. ..... 175

D

Detroit Steel Corp. ..... 54
Diehl Mfg. Co. ..... 40
*Duraloy Co. ..... 154
*Dykem Co. ..... 165

E

*Edgewater Steel Co. ..... 146
Electrode Div. Great Lakes Carbon Corp. ..... 158
Erie Foundry Co. ..... 62
*Euclid Crane & Hoist Co. ..... 48

F

Falk Machinery Co. ..... 182
*Federal Bearings Co., Inc. ..... 49
*Foote Mineral Co. ..... 36-37
*Foster, L. B. Co. ..... 29
Frasse, Peter A. & Co., Inc. ..... 26
Fuller Co. ..... 124

G

Gardner Machine Co. ..... 8
*General Electric Co. ..32-33, 148-149
Gilbert Merrill Steel Corp. ..... 183
*Gisholt Machine Co. ..... 19
Goss & DeLeeuw Machine Co. ... 165
Great Lakes Carbon Corp. ..... 158
Great Lakes Founders & Mch. Corp. ..... 175

H

Hanna Furnace Corp. ..... 42
*Hansen Mfg. Co. ..... 138
Harvey Aluminum ..... 183
*Haynes Stellite Co. Div. Union Carbide Corp. ..... 28
Heat & Power Co., Inc. ..... 178
Henry & Company, Inc., A. T. ... 179
*Houghton, E. F. & Co. ..... 60
Hughes, Arnold, Co. ..... 182, 183
Hyman, Joseph & Sons ..... 179

I

*Ipsen Industries, Inc. ..... 16

J

Jones & Laughlin Steel Corp., Stainless & Strip Div. ..... 61

K

Kidde, Walter & Co., Inc. ..... 137
Kirk & Blum Mfg. Co. ..... 147

L

Lang Machinery Co. ..... 182
Linde Co., Div. Union Carbide Corp. ..... 51
*Lodge & Shipley Co. ..... 157
Lukens Steel Co. ..... 20-21
Luria Bros. & Co., Inc. ..... 167, 180-181

M

*McKay Machine Co. ..... 116-117
McLouth Steel Corp. ..... 133
*Malleable Castings Council ..150-151
Marathon Specialty Steels, Inc. .. 64
Matthews, James H., & Co. ..... 96
Mesta Machine Co. ..... Inside Front Cover
Metal & Thermit Corp. ..... 88
Michigan Tool Co., Cone-Drive Gears Div. ..... 140
Milwaukee Forge & Mch. Co. ..... 17
Minneapolis-Honeywell Regulator Co. ..... 44-45
Morse Twist Drill & Mch. Co. ..... 98
*Mundt, Chas. & Sons ..... 165

N

National Steel Corp. ..... 42
New Departure Div., General Motors Corp. ..... 14
New York & New Jersey Lubricant Co. ..... 142
*Niagara Machine & Tool Works 31
*Norton Co., Refractories Div. ... 94

O

*Ohio Crankshaft Co. ..... 152
*Olsen, Tinius, Testing Machine Co. ..... 165
*Osborn Mfg. Co. Brush Div. ..... 132
Ottemiller, Wm. H. Co. ..... 184

P

Pangborn Corp. ..... 156
*Philadelphia Gear Corp. ..... 6
Pittsburgh Engineering & Machine Div. Pittsburgh Steel Foundry Co., Textron, Inc. ..... 123
Pittsburgh Metals Purifying Co. .. 97
Pollock Engineering Co., Inc. .... 135
Pollock Industries, Inc. ..... 178
Production Carbide & Steel Co. .. 183

R

Rapid Electric Co. ..... 52
Roebling's, John A. Sons, Div. Colorado Fuel & Iron Corp. .. 18
*Ruthman Machinery Co. ..... 134

S

Salem-Brosius, Inc. ..... 115
Shell Oil Co. ..... 161
Shenango Furnace Co. ..... 143
Shepard Niles Crane & Hoist Corp. ..... 144
Snyder Corp. ..... 90
*Somers Brass Co., Inc. ..... 118
Southern Screw Co. ..... 25
Sperry Products Co. ..... 128
Stanhope, R. C. Inc. ..... 182
Sunbeam Equipment Corp. ..... 127
Sun Shipbuilding & Dry Dock Co. 155
Swift-Ohio Corp. ..... 131
Sylvania Electric Products, Inc. .. 24

T

*Texaco, Inc. ..... 57
Tractor & Equipment Co. ..... 182
*Tri-State Engineering Co. ..... 92

U

*Uddeholm Co. of America, Inc. 140
Ulbrich Stainless Steels ..... 163
*Union Carbide Corp., Haynes Stellite Div. ..... 28
Union Carbide Corp., Linde Co. Div. ..... 50-51
United Engineering & Foundry Co. 59
United States Steel Corp. ..... 177
Universal Grinding Corp. ..... 178
Universal Machinery & Equipment Co. ..... 182

V

Vascoloy-Ramet Corp. ..... 58
*Verson Allsteel Press Co. Back Cover
Vollrath Co. ..... 130
Volyn, Paul ..... 182
Voss Engineering Co. ..... 41

W

Wallack Bros. ..... 183
Ward Steel Co. ..... 126
Waterbury-Farrel Foundry & Machine Co. Div., Textron, Inc. 55
Weiss Steel Co. Inc. ..... 183
Wiedemann Mch. Co. ..... 153
*Williams-White & Co. ..... 43
*Wilson, Lee, Engineering Co., Co. ..... Inside Back Cover

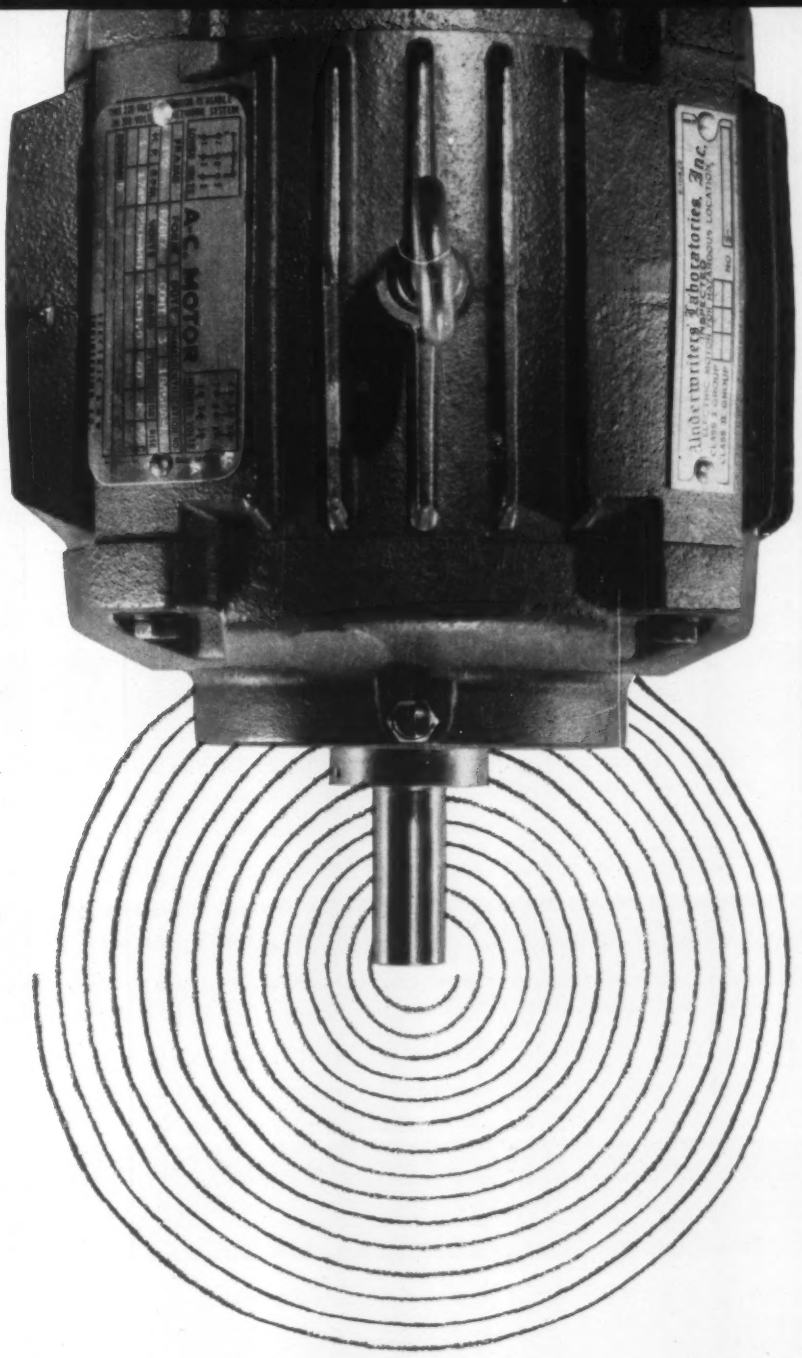
Z

Zimmer & Co., A. W. ..... 179


**CLASSIFIED SECTION**


Clearing House ..... 178-182
Contract Manufacturing Appears in first and third issue of each month. See May 4, 1961 issue.
Employment Exchange ..... 183
Equipment & Materials Wanted.. 183

WHO*
In the best circles you'll find they use only . . .
Ottemiller
CAP SCREWS • SET SCREWS • MILLED STUDS
CUSTOM SCREW MACHINE SPECIALTIES
*Wm. H. Ottemiller Co.
YORK, PENNSYLVANIA

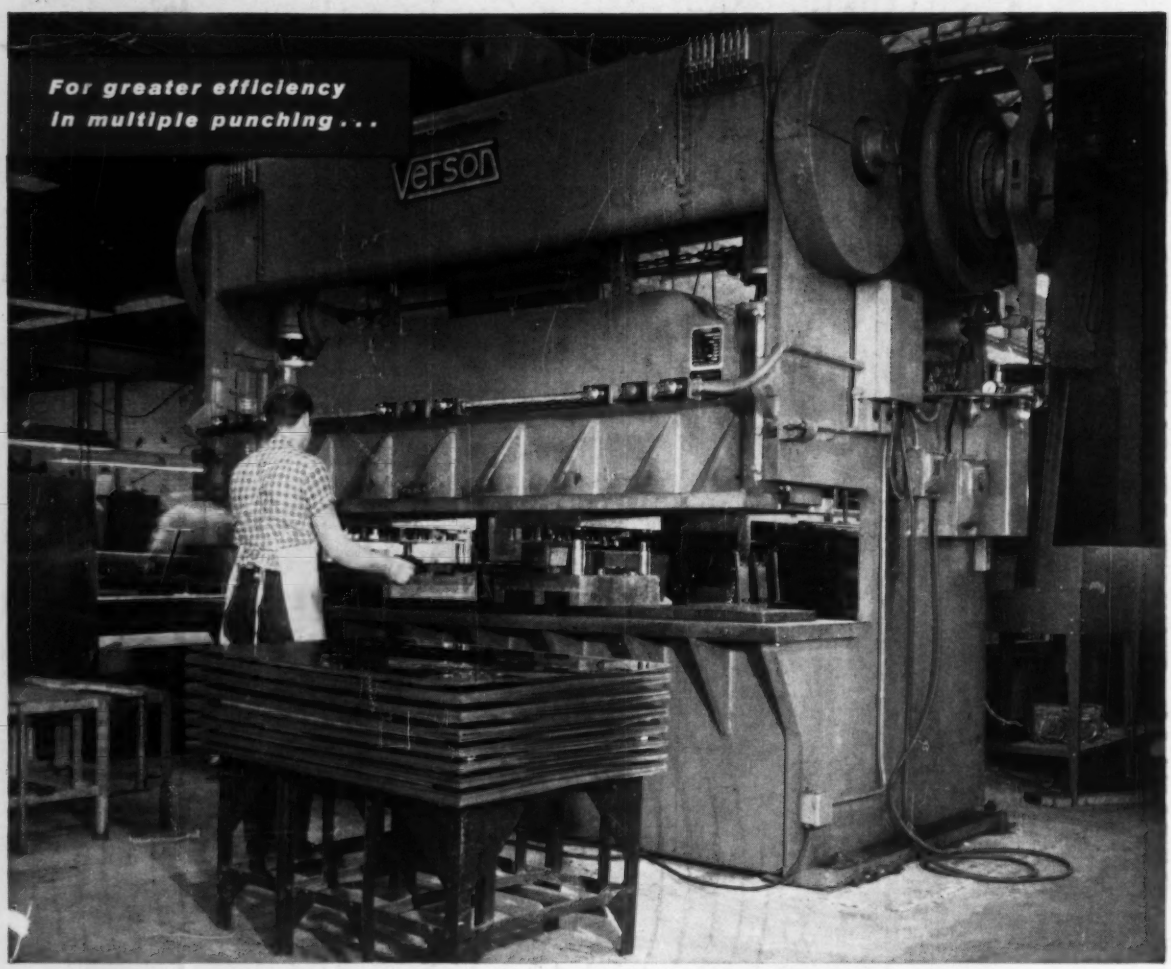



# OPEN UP: for better electrical steels

The Open Coil Process of Gas Alloying permits the control of carbon after the steel has been rolled. Carbon can be removed during the annealing operation. This means that silicon steels of better magnetic properties can be easily and economically produced. By removing carbon from plain carbon steel it becomes an excellent replacement for low silicon grades in many applications. To get all the details on this revolutionary new Open Coil Process of Gas Alloying write for Bulletin OC-960 to *Lee Wilson Engineering Co., Inc., 20005 Lake Rd., Cleveland 16, Ohio.*

Lee Wilson

Originators and Leading Producers of Open Coil and Single Stack Furnaces




# Take advantage of the Specialized Design of Verson Gang Punching Machines

If you're using makeshift arrangements or adapting other equipment for your multiple punching requirements, it may pay you to take a look at a machine that's designed and built for multiple punching.

At the Benjamin Division of Thomas Industries, Des Plaines, Illinois, for example, the 100 ton Verson Gang Punching Machine illustrated is contributing to production economy and product quality on lighting equipment. It has improved efficiency and accuracy on a wide range of piercing and punching operations.

With Verson Gang Punching Machines you can choose from capacities ranging from 60 to 600 tons and bed and ram lengths from 72" to 144" and longer. Write for descriptive bulletin or discuss your needs with your Verson Representative soon.

**KEY FEATURES:**
**VERSON GANG PUNCHING MACHINE**

- Heavy steel plate bed and ram construction
- Six point square type gibs, independently adjustable
- Pneumatically counterbalanced ram
- Herringbone gears
- Oversize friction clutch and brake unit
- Power adjustment of ram
- Quill mounted flywheel
- Centralized lubrication system

*Originators and pioneers of allsteel stamping press construction*

**VERSON ALLSTEEL PRESS CO.**

Verson

257-C

**9314 S. Kenwood Avenue, Chicago 19, Illinois • 8300 S. Central Expressway, Dallas, Texas**

MANUFACTURERS OF MECHANICAL AND HYDRAULIC PRESSES AND PRESS BRAKES • TRANSMAT PRESSES • IMPACT MACHINING PRESSES
TOOLING • DIE CUSHIONS • VERSON-WHEELON HYDRAULIC PRESSES • HYDRAULIC SHEARS • PLASTICS MOLDING PRESSES